BIBLIOGRAPHY OF Technical Reports

Contents

September 14, 1951
Vol. 16, No. 3

Research and the NACA..... 65
Apparel..... 67
Chemicals and Allied Products..... 67
Detergents..... 67
Plastics and Plasticizers..... 67
Paints, Varnishes and Lacquers..... 69
Ordnance Chemicals..... 70
Chemical Engineering..... 70
Miscellaneous Chemicals..... 70
Electrical Machinery..... 70
Communication Equipment..... 71
Electronics..... 71
Generators, Motors, Transmission..... 76
Miscellaneous..... 77
Food and Kindred Products..... 78
Fuels and Lubricants..... 78
Instruments..... 79
Machinery..... 80
Medical Research and Practice..... 81
Metals and Metal Products..... 82
Meteorology and Climatology..... 85
Minerals and Mineral Products..... 86
Packing and Packaging..... 90
Paper and Allied Products..... 90
Photographic and Optical Goods..... 90
Physics..... 91
General..... 91
Nuclear..... 93
Rubber and Rubber Products..... 93
Structural Engineering..... 95
Textiles and Textile Products..... 96
Transportation Equipment..... 96
Aeronautics..... 96
Aircraft..... 96
Instruments..... 98
Engines and Propellers..... 98
Aerodynamics..... 100
Water Supply, Sanitation..... 100
Miscellaneous..... 101
NEWSLETTER IN CENTER FOLD

NOTE: The Office of Technical Services is responsible, under Presidential order, for aiding in the adequate dissemination of technical reports of benefit to American science and industry. Except to the extent indicated by acknowledgement of authorship, the Office does not edit reports, nor does it accept responsibility for information and opinions contained in them. Patents may cover the subject matter of any report—the reader is advised to make suitable patent searches before developing applications based on the reports.

PROCEDURE FOR ORDERING REPORTS

1. Order by PB report number.
2. Orders for reports in microfilm or photostat type of reproduction listed in the Bibliography of Technical Reports should be addressed to the Library of Congress, Photoduplication Service, Publication Board Project, Washington 25, D. C. Check or money order accompanying orders for microfilm or photostat reports should be made payable to the Librarian of Congress.
3. Orders for reports available in printed form should be addressed to the Department of Commerce, Office of Technical Services, Washington 25, D. C. Check or money order accompanying order for printed reports should be made payable to the Treasurer of the United States.
4. Foreign purchasers of reports, other than Canada and Mexico, should include an additional amount for postage according to the following scale:

   A. Printed reports, mimeograph reports, and photostats: Approximately 4 pages per ounce.

   B. Microfilm: Approximately 50 frames per ounce.

   Rates will vary for different countries. It will be the purchaser's responsibility to compute postage from his country.

This publication is issued by the U. S. Department of Commerce, Office of Technical Services, Washington 25, D. C., on a subscription basis, $5 for 1 year. Foreign subscribers are requested to remit $3 additional for postage. Subscription price of the Newsletter is $0.50 per year.

Published with the approval of the Director of the Bureau of the Budget

---

The reports listed have been received from civil and military agencies of the United States Government and from cooperating foreign governments. Many of the reports cover information captured in enemy countries. Secrecy restrictions on all reports listed have been lifted.

UNITED STATES DEPARTMENT OF COMMERCE

Charles Sawyer, Secretary

OFFICE OF TECHNICAL SERVICES

John C. Green, Director

U. S. DEPARTMENT OF COMMERCE

OFFICE OF TECHNICAL SERVICES

BIBLIOGRAPHY OF Technical Reports

September 1951

RESEARCH AND THE NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

A storehouse of research information -- free to anyone who can make use of it. Such is the description by one of the nation's leading magazines of the National Advisory Committee for Aeronautics and its work.

Naturally enough, much of the NACA's research information is useful only to America's plane and engine builders, but in the performance of its work, the government's aeronautical research agency comes up with answers to fundamental problems which are of concern to all kinds of industries.

For example, the investigations of materials, alloys and fuels, conducted specially for possible use in improving gas turbines and rotary compressors, may and do provide information of real value to non-aviation manufacturers. The same principles which affect the aeronautical gas turbine and rotary compressor affect also the turbines and compressors to be found in central power stations and pipeline pumping stations.

The NACA was established in 1915 by the Congress, and instructed to "supervise and direct the scientific study of the problems of flight with a view to their practical solution", and also to "direct and conduct research and experiment in aeronautics. In the fulfillment of these obligations, the NACA has sought over the years to assess the current status of development of aircraft, both civil and military; to anticipate the needs for scientific research and engineering data so far as possible, and to provide the staff and facilities to obtain needed information as rapidly as may be consistent with national interest. Its research program has both the long-range, all-inclusive objective of acquiring the new scientific knowledge essential to assure American leadership in aeronautics, and the more immediate aim of solving, as quickly as possible, the most pressing aeronautic problems.

Over the years, general direction, policy guidance and inspiration have been furnished by an unpaid "board of directors", which is the Committee itself. Composed today of seventeen men appointed by the President and responsible to him, the Committee is made up of scientists from private life, industry executives and representatives of the government most directly concerned with aeronautics, including the Air Force, Navy, Commerce and federal scientific agencies. The Committee meets monthly to discuss research program and budgets, to survey the present problems and forecast the future problems confronting aircraft designers and operators, and the military services, and to initiate the research necessary to meet the needs.

The Committee is assisted in its determination of policy by five major and twenty-two subordinate committees similarly organized, the membership of which also serve without compensation. Thus the talent of America has been marshaled to produce a coordinated program of scientific research.

These several committees recommend and review the research programs in progress and yet to be undertaken. Committee members are keenly conscious of the great costs in dollars and manpower implied by modern aeronautical research, and no less aware of the necessity for maintaining effective teamwork among the various governmental and private agencies and the aircraft industry itself with regard to implementing aeronautical research and development.

Most of the problems recommended for investigation are assigned to NACA's laboratories, which today represent an investment of more than $100,000,000. Flight propulsion problems go to the newest of the three main research centers, the Lewis Laboratory at Cleveland, where some 2500 scientists and other workers are employed. At the Ames Laboratory at Moffett Field, California, another 1200 NACA employees are concentrating on aerodynamic research, while at the Langley Laboratory in Virginia 330 men and women conduct research on aerodynamic and a host of other aeronautical problems. It is at Langley that much of the research specifically directed at lightplane problems is carried on. Smaller NACA organizations are located at Wallops Island, off the Virginia Coast, where research on models in flight in the transonic and supersonic ranges is conducted through use of rocket-powered missiles, and at Muroc Lake, California, where flight research is conducted using full-scale transonic and supersonic airplanes.

NACA also sponsors and finances a coordinated program of research at more than twenty nonprofit scientific and educational institutions, as well as at the National Bureau of Standards and the Forest Products Laboratory, thus to supplement the work carried on at NACA's own research centers. Here again, a considerable portion of the sponsored research has definite interest to the lightplane industry.

Research results, including both information obtained at NACA's Laboratories and that developed elsewhere under NACA sponsorship, are distributed in the form of Committee publications. Reports and Technical Notes, containing information that is unclassified, are available to the public. Those reports which contain classified material are carefully controlled as to circulation, for reasons of national security.

To sum up, NACA's continuing research program is significant both to civil and military aviation. Although civil aviation may place different values and different emphasis upon such considerations as performance, safety, reliability, comfort and economy, solution of aeronautic problems will affect both personal and transport as well as military aircraft.

Actually, the research problems of civil aviation often are indistinguishable from those of military aviation, although there may be an apparent divergence between the developments of military and commercial types of aircraft. The important consideration is that basic scientific research is applicable to both. Military development for obvious reasons has borne the brunt of the cost and effort of pioneering higher performance and of developing new power plants, but civil development in turn contributes importantly to military aviation in such matters as reliability, safety, comfort, economy and operational practice.

John F. Victory
Executive Secretary
Natl. Adv. Comm. Aero.

APPAREL

STERILIZATION OF FOOTWEAR TO PREVENT REINFECTION WITH TINEA PEDIS (ATHLETE'S FOOT), by John D. Fulton and Roland B. Mitchell. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1951. 10p photos, tables Mi $1.25, Ph $1.25. PB 104299

A study was made to determine whether or not it is possible to sterilize shoes with Carboxide gas and ethylene oxide gas and to improvise containers, using readily available materials for carrying out this process. Simple exposure chambers for the sterilization of shoes were designed, constructed, and tested. A container improvised from a section of inner tube from a B-29 type aircraft tire was found most satisfactory. Leather samples contaminated with certain pathogenic fungi were sterilized by exposure to Carboxide gas. Well-worn shoes were sterilized by exposure to certain concentrations of ethylene oxide gas. AAF SAM Project 21-35-002, Report no. 2.

CHEMICAL AND ALLIED PRODUCTS

Detergents

PRODUCTION OF SOAPS AND EDIBLE FATS FROM FATTY ACIDS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1939-1943. 182f photos, drawings, graphs, tables (Text in German) Mi $6.75, Enl Pr $25.00. PB 104187

1. Soaps - Manufacture - Germany 2. Fatty acids - Uses - Germany 3. Fats, Edible - Production - Germany 4. Fats, Edible - Production - Plants - Germany 5. Paraffin wax - Oxidation - Germany 6. Acids, Carboxylic - Preparation - Germany 7. Micro BIOS FD 5463/47, Frames 1-194.

Abstract available as PB 104187s. 2p. Mi $1.25, Ph $1.25.

REPORT ON INVESTIGATION OF CRAZE-INDUCING PROPERTIES OF ACRYLIC CLEANERS, by Charles A. Cassola. U. S. Naval Air Material Center. Aeronautical Materials Laboratory, Philadelphia, Pa. Aug 1949. 27p photos, diagrs Mi $2.00, Ph $3.75. PB 104417

The comparative craze-inducing properties of kerosene and two samples representing one proprietary acrylic cleaner on standard AN-P-44a acrylic material were investigated. It was found that of the three samples tested, kerosene is harmful to acrylic material and that proprietary cleaner should not be used on acrylic surfaces stressed above 2000 psi. The craze-inducing properties of the Douglas sample of the cleaner were greater than the NAES sample. It is recommended that the proprietary cleaner to be considered satisfactory. NAM AML 440016, pt. 1.

USE OF CITRIC ACID AS AN ANTISETTING AND STABILIZING AGENT FOR GRADE 3 AND SUPER-TROPICAL BLEACHING POWDER SLURRIES, by M.F. Gilchrist. U. S. Chemical Corps. Technical Command, Army Chemical Center, Md. Apr 1951. 12p tables (2 fold) Mi $1.75, Ph $2.50. PB 103872

1. Powders, Bleaching - Tropical deterioration - Prevention 2. Powders, Bleaching - Stabilizing agents 3. Citric acid - Uses 4. CC TCIR 638. Project 4-08-06-004.

Plastics and Plazticizers

CALCULATION OF BULK VISCOSITY OF POLYISOBUTYLENE FROM RELAXATION OF STRESS DATA, by R. D. Andrews and A. V. Tobolsky. Princeton University. Plastics Laboratory. Dec 1949. 33p diagrs, graphs, tables Mi $2.25, Ph $5.00. PB 104163

The general theory of elastoviscous behavior predicts a direct relation between the bulk viscosity and the stress relaxation of materials showing both elastic and viscous behavior. A simple distribution of relaxation times is discussed, representing the relaxation of stress in polyisobutylene to a good approximation, in the relaxation region in which relaxation data is used to calculate bulk viscosity. Using this distributional function, experimental values of bulk viscosity for polyisobutylene fractions of different molecular weights at different temperatures can be successfully predicted from stress relaxation data, thus making possible a direct correlation of results from the two types of experiment. Dept. of the Army project: 3-99-15-022. Signal Corps Project: 152B. PU PL TR 16A. SIG Contract W-36-039-sc-32011.

FORMATION OF LOW MOLECULAR WEIGHT POLYMERS USING CHAIN TRANSFER AGENTS. I: THEORY, by R. C. Fettes, A. V. Tobolsky, and D.H. Johnson. Princeton University, Plastics Laboratorv. Mar 1950. 17p graphs Mi $1.75, Ph $2.50. PB 104347

1. Polymers - Fabrication 2. Chain reactions - Theory 3. SIG Contract W36-039-sc-32011 4. PU PL TR 17A. 5. Tropical deterioration - Tests 6. Harvard University, Cambridge, Mass. 7. QMC MSR 15.

Dept. of the Army project: 3-99-15-022. Signal Corps project: 152B.

GUANAMINE-FORMALDEHYDE RESINS AND LAMINATES, by P. J. Boeke, J. Willoch and N. Vasileff. Princeton University. Plastics Laboratory. Dec 1949. 27p graphs, tables Mi $2.00, Ph $3.75. PB 104162

An investigation was made to develop an arc-resistant, low-loss, insulating thermosetting resin which, when incorporated in laminates, would provide satisfactory punching qualities. Melamine structure was modified by substitution of one of the amino groups with alkyl or aryl groups and condensing the resulting compounds, guanamines, with formaldehyde. The hardness and electrical properties of several unfilled guanamine resins are compared with melamine resin. Phenyl aceto guanamine was found to be the most promising from the viewpoint of high arc resistance, improved loss factor and decreased hardness. In preparing laminates from phenyl aceto guanamine resin, a 70% dioxane - 30% water solvent was the most favorable. Dept. of the Army Project: 3-99-15-022. Signal Corps Project: 152-B. PU PL TR 16B. SIG Contract no. W-36-039-sc-32011.

IMPROVED GLASS CLOTH ARC RESISTANT LAMINATES, by A. L. Alesi, P. J. Boeke, and N. Vasileff.

Princeton University, Plastics Laboratory. Jul 1950. 15p diagr, graphs, table Mi $1.75, Ph $2.50. PB 104415

1. Glass cloth, Laminated - Electrical properties 2. Insulating materials - Fiberglas 3. SIG Contract W36-039-sc-32011 4. PU PL TR 18C.

Dept. of the Army project: 3-99-15-022. Signal Corps project: 152-B.

INFRARED-TRANSMITTING FILTERS: INTERIM REPORT NO. 3 FOR THE PERIOD APRIL 15, 1948 TO JUNE 15, 1948 UNDER ENGINEERING RESEARCH AND DEVELOPMENT LABORATORIES CONTRACT W-44-009 ENG-544, by R. S. Corley. Polaroid Corp., Cambridge, Mass. Jun 1948. 32p photos, graphs, tables Mi $2.25, Ph $5.00. PB 104389

Progress made in the development of infrared-transmitting filters is described. A number of suitable powders have been obtained and a systematic study begun of their filter properties alone, in supporting media, and in conjunction with absorber-type filters. Preliminary results have shown that the combination of C-sheet (dehydrohalogenated polyvinylchloride) with a powder layer is promising for a band filter in the region 3.5 to 5.5 mu. C-sheet can now be made uniformly in 6-8 in. diam disks. Polyvinylbutyral type laminations were found to withstand continuous exposure to 100°C of dry heat for better than one week. A slit-changing mechanism has been attached to the recording infrared spectrograph, rendering the energy curve substantially flat from 1 to 15 mu (except for the water-band region).

INJECTION MOLDING, by Rawson E. Stark. Stupakoff Ceramic & Mfg. Co., Latrobe, Pa. Oct 1946. 12p photos Mi $1.75, Ph $2.50. PB 104096

1. Plastics - Molding, Injection 2. Insulating materials - Plastics 3. SIG Contract W36-039-sc-32376 Report no. 1.

For reports no. 3-6, 9-10 on this contract see PB 104097-104102.

ISOPRENE-ACRYLONITRILE COPOLYMERS, by Y. Conwell and A. V. Tobolsky. Princeton University, Plastics Laboratory. Mar 1950. 19p tables Mi $1.75, Ph $2.50. PB 104416

1. Copolymers 2. Isoprene - Copolymers 3. Acrylonitrile - Copolymers 4. SIG Contract W36-039-sc-32011 5. PU PL TR 17B.

Dept. of the Army project: 3-99-15-022. Signal Corps project: 152B.

LOW K, LOW LOSS, HIGH ARC RESISTANCE SILICONE MOLDING COMPOUND, by T. Zawadzki and N. Vasileff. Princeton University. Plastics Laboratory. Jun 1950. 13p graph, tables Mi $1.75, Ph $2.50. PB 104383

Twenty formulations of various resin and filler compositions were tested in association with work on low K, low loss, high arc-resistant material meeting the general requirements of Spec JAN-P1-14 type MTS E-4 with an added postulate of high arc-resistance. The aim was to decide which composition would give the most stable electrical properties. The problem was attacked by incorporating, in a suitable silicone resin, a mineral filler which is not detrimental to the electrical properties of the silicone resin and acts simultaneously as a mechanical reinforcing agent. A material meeting the requirements was developed by incorporating a diatomaceous filler in a commercial silicone resin with the addition of a new, specially developed catalyst. Although weak in some mechanical properties, the material which was developed has good electrical stability under conditions of high humidity. Dept. of the Army Project: 3-99-15-022. Signal Corps Project: 152B. Research reported here was sponsored jointly by the Army, Navy and Air Force under Signal Corps Contract no. W-36-039-sc-32011. PU PL TR 18B. SIG Contract W-36-039-sc-32011.

MECHANICAL PROPERTIES OF ORIENTED POLYSTYRENE, by Bryce Maxwell. Princeton University. Plastics Laboratory. Jul 1950. 22p photos, graphs Mi $2.00, Ph $3.75. PB 104380

When polystyrene is heated to a temperature above its second order transition and is stretched and cooled without allowing strain recovery, two types of materials can be formed. One is a strong but brittle material which crazes, and the other is a ductile material which can be further oriented. A study was made of the factors which produce these two types of material, and it has been determined that the cooling rate after hot orientation is the controlling factor. The equipment and procedure for orientating test specimens are described, and the results of physical tests on these specimens are given, together with theoretical interpretations of the data. Dept. of the Army Project: 3-99-15-022. Signal Corps Project: 152B. Research reported here was sponsored jointly by the Army, Navy and Air Force under Signal Corps Contract no. W-36-039-sc-32011. PU PL TR 18D.

NEL CASTING RESINS. INTERIM REPORT NO. 2, by Edward Rolle. U. S. Navy Electronics Laboratory, San Diego, Calif. Feb 1950. 20p Mi $1,75, Ph $2.50. PB 104344

An improved thermosetting plastic, designated NEL Resin No. 177 for encapsulating subminiature electronic circuits was developed by the Navy, Electronic Laboratory. Its superiority has been established through practical use in casting subminiature circuits, and through preliminary tests to determine its electrical and physical properties. The preparation and use of the new resin are discussed, examples are given of typical applications, and the electrical and physical characteristics which have been determined are described. The chemical ingredients of the resin are given in proportions by weight, and names and addresses of manufacturers supplying them are listed. For 1st Interim report see PB 104384. NE 111602. Report 165. Problem NEL 6F2. Contents: Appendix I. Special problems and advantages of cast subminiature circuits. - Appendix II. Sources of ingredients used in NEL resin 177. NELS R165.

NEL CASTING RESINS. INTERIM REPORT, U. S. Navy Electronics Laboratory, San Diego, Calif. Sep 1949. 16p photos, graphs, table Mi $1.75, Ph $2.50. PB 104384

Three new thermosetting casting resins suitable for potting or embedding small electronic circuits were developed. The resins are resistant to solvents absorption, impact, compression, heat, and other conditions imposed in their local applications. NEL resin No. 50 makes possible castings employing subminiature tubes because it is resistant to temperatures up to 350°F, and has adequate physical and

mechanical properties. Its upper frequency limit is 100 mc. NEL resin No. 51 permits new developments in sonar hydrophone and should be suitable for use in the laboratory betatron. Compounding, processing, and general characteristics of the resins are described, and physical, mechanical, and utilization tests are outlined. For Interim report no. 2 see PB 104344. Report 133. Problem 1L2. NELS R133.

QUARTERLY STATUS REPORT, NUMBER 17, COVERING THE PERIOD 1 JANUARY 1950 TO 31 MARCH 1950, by Louis F. Rahm, Project Director. Princeton University. Plastics Laboratory. Apr 1950. 9p tables Mi $1.25, Ph $1.25. PB 104156

Progress made on the projects of the Plastics Laboratory of Princeton University is outlined. Relaxation studies near the second order transition point of styrene and methacrylate have been continued. The physical and chemical properties of potting compounds have been investigated. Quick-curing catalysts for silicone resins and their application to molding materials are being studied. A number of materials are under investigation for the preparation of high-K low-loss materials. Improved equipment has been obtained for electrical measurements between 1 and 100 mc, and two tuned amplifiers were completed for use with bridge circuits. The arc resistance studies are nearly complete and a report is being prepared. Torsion and tensile studies are being made of styrene and methacrylate from 30° to 90°C. Polystyrene studies are being conducted. Dept. of the Army Project: 3-99-15-022. Signal Corps Project: 152B. PU PL TR 17. Contract W-36-039-sc-32011.

SERVICES, FACILITIES AND MATERIALS REQUIRED FOR INVESTIGATIONS AND STUDIES ON SYNTHETIC RESINOUS MATERIALS: TRI-MONTHLY PROGRESS REPORT NO. 3 FOR THE PERIOD MARCH 1-JUNE 1, 1950 UNDER SQUIER SIGNAL LABORATORY CONTRACT DA36-039-SC-13, by S. G. Cohen and M. S. Simon. Polaroid Corp., Cambridge, Mass. Jun 1950. 44p graphs, tables Mi $2.50, Ph $6.25. PB 104385

Progress in the investigation and study of synthetic resinous materials for embedding electrical and electronic equipment is reported. A styrene with an alkyl substituent which is predominantly tertiary has been prepared, as well as amylstyrene in 80% yield from amyl-benezene. Attempts to prepare vinyl hydrocarbons by the condensation of vinylchloride with an aromatic hydrocarbon in the presence of sulfuric acid or hydrogen fluoride has been unsuccessful. Attempts to shorten the curing time of hydrocarbon resins are described. Castings and embeddings have been carried out to test resins already described or new ones synthesized or received during this quarter. Data are included on the capacity, power factor, and leakage resistance of a number of Sprague paper condensers impregnated with a styrene-butadiene composition. Research Department Project RC-18. Dept. of the Army Project: 3-98-00-500. Signal Corps Project: no. 32-2005-33.

Paints, Varnishes and Lacquers

LIQUID AND VAPOR CORROSION INHIBITORS, by H. R. Baker, and W. A. Zisman. U. S. Naval Research Laboratory. May 1951. 14p diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 104313

Postwar research on polar-type rust inhibitors for nonaqueous fluids has revealed that both soaps and amine-acid complexes act as rust inhibitors in oils through the release of organic acids which had been held by association. It has been shown that the most effective rust-inhibiting additives are those which remain in the oil in the most highly dispersed colloidal condition and which supply those organic acids having the greatest ability to inhibit steel. The most effective acids are those which react with the iron surface to form soaps in situ. No good evidence has been reported yet showing these soaps to be the same as soaps made in bulk and then added to the oil. Both amines and soaps can associate with carboxylic acids and thus can be used in oils to neutralize acids, act as peptizers or coupling agents, and deterge acidic and insoluble oxidation products. Experiences in various laboratories have indicated the unsuitability of humidity cabinets for corrosion testing and have demonstrated the advantages of both the NRL fog cabinet and the static water-drop corrosion test methods for research and control purposes. The effectiveness of the substituted ammonium nitrites as vapor-type inhibitors has been shown to be due both to the ability of the molecule to form an adsorbed hydrophobic monolayer and to the additional inhibition imparted by the nitrite portion of the molecule through a passivation mechanism. NRL R3824.

REPORT ON QUALIFICATION TESTING OF ORGANIC FINISHING MATERIALS. ANA SPECIFICATION AN-T-93 TINTING PASTE. PROPOSED ANA BULLETIN, by Francis D. Reali. U. S. Naval Air Material Center. Aeronautical Materials Laboratory, Philadelphia, Pa. Aug 1949. 11p tables Mi $1.75, Ph $2.50. PB 104342

Tests were conducted of tinting pastes for qualification under Specification An-T 93. The tinting paste is formulated with essentially the same ingredients as used in the production of zinc chromate primer, with the exception of using lampblack as the prime pigment. The paste is used for tinting zinc chromate primer to a color approximating Interior Green Color No. 611. The tinted primer is used either as a final coat on interior surfaces of aircraft, or as a second primer coat to establish a color differential to aid the sprayer in applying a continuous second coat. Results showed that the tinting paste is satisfactory for use with the primers. A table is appended, listing the approved materials used in the manufacture of tinting pastes. NAM AML 424338(4).

Ordnance Chemicals

REACTIVATION OF SPENT DESSICANTS, by Arthur M. Reeves. U. S. Chemical Corps. Technical Command, Army Chemical Center, Md. Aug 1950. 14p Mi $1.75, Ph $2.50. PB 104484

Investigations were conducted to determine the feasibility of reactivating spent dessicants contaminated with moisture and various hydrocarbons. The life and efficiency of reactivated dessicants were compared with the original dessicant by prescribed specification methods. Water contaminated materials were reactivated by drying the dessicants (including silica gel, alumina, and bauxite) at 250°-275°F for a period of 24 hours. It was concluded that attempts should be made to reactivate only such dessicants that have had moderate contamination with water; and that the reactivated materials should pass specification be-

fore use. Dessicants contaminated with oils, and those grossly contaminated with water, should be surveyed as unfit for further use. Project 4-08-03-006. CC TC1R 595.

Chemical Engineering and Equipment

CENTRIFUGATION BIBLIOGRAPHY, by J. O. Maloney and Archer C. Wilcox. Kansas. University. Dept. of Chemical Engineering. Apr 1950. 42p Available from University of Kansas. Dept. of Chemical Engineering, Lawrence, Kansas. PB 104085

1. Centrifuges - Bibliography 2. Centrifuges - Patents - Bibliography.

Part of thesis submitted by Archer C. Wilcox. University of Kansas publications. Engineering bulletin no. 25.

FORMALDEHYD, APPARATUR UND VERFAHREN (FORMALDEHYDE, APPARATUS AND PROCEDURE). I. G. Farbenindustrie A. G., Leverkusen, Ger. Dec 1945. 55f drawings (Text in German) Mi $2.75, Enl Pr $8.75. PB 103990

1. Formaldehyde - Production - Germany 2. Formaldehyde - Production - Equipment - Design - Germany 3. Micro BIOS/DOCS/3430/2093/1-3 4. Micro BIOS/DOCS/3430/2715/1-10 5. Micro BIOS FD 2279/48, Frames 1-15.

Drawings are BIOS/DOCS/3430/2715/1-10.

RENALDESTILLATION (DISTILLATION OF HYDROGEN PEROXIDE FROM "RENAL"), by Sinn. I. G. Farbenindustrie A. G., Oppau, Ger. Aug 1944. 16f drawings, graphs (Text in German) Mi $1.75, Enl Pr $3.75. PB 103991

1. Hydrogen peroxide - Distillation - Germany 2. Renal - Germany 3. Micro BIOS FD 3114/46, Frames 1-13.

Abstract available as PB 103991s. 1p. Mi $1.25, Ph $1.25.

Miscellaneous Chemicals

ADSORPTION OF HYDROPHOBIC MONOLAYERS OF CARBOXYLIC ACIDS, by H. R. Baker, Elaine G. Shafrin, and W. A. Zisman. U. S. Naval Research Laboratory. Jan 1951. 25p diagrs, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 103608

A previously reported contact-angle method has been extended to the study of the adsorption from aqueous solution of a variety of types of mono- and dicarboxylic acids. Since emphasis was to be given to physical adsorption, it was most convenient to use platinum foil as the adsorbing surface. The effects have been investigated of varying the hydrogen-ion concentration over the range of pH2 to pH12 and of varying the molal concentration of solute over a 10,000-fold range. The results are explained in terms of the formation of an absorbed monomolecular layer whose water-repellency has been related to the molecular structure, orientation, and packing. The equivalence of the maximum contact angle (θ_{lim}) of the film adsorbed from the solution to that (θ_{melt}) obtained from films made from the molten polar compound investigated is demonstrated. A new thermal-gradient method of preparing and isolating a close-packed adsorbed monolayer on platinum is described. It is more general than the oleophobic method described in previous reports, since it has been found applicable to all amphipathic compounds tried-whether straight-chain, branched, or cyclic. Further research possibilities are indicated. NRL R3805.

DETERMINACION CUANTITATIVA DE CANFENO EN MEZOLAS CON PINENO (QUANTITATIVE DETERMINATION OF CAMPHENE IN MIXTURES WITH PINENE), por Andres Dante Fortunato y Haydee Hourquebie. Argentine Republic. Ministerio de Industria y Comercio. Subsecretaria de Industria y Contralor Comercial. Direccion General de Industria Manufacturera. Instituto Technologico. 1950. 18p graphs, tables (Text in Spanish) Mi $1.75, Ph $2.50. PB 103571

1. Camphene - Determination - Argentine Republic 2. Pinene - Argentine Republic.

Serie A, Numero 4.

FLUORITE FLOTATION I: DEVELOPMENT OF NEW FLOTATION TECHNIQUES, BY J. HUGH HAMILTON, J. W. JOHNS, JR., AND HAROLD BRADFORD. II: THEORY OF OLEIC ACID COLLECTOR ACTION, BY MELVIN A. COOK AND ARTHUR W. LAST. III: IMPROVEMENT OF SELECTIVITY OF OLEIC ACID BY THE USE OF VITAMIN D TYPE ADDITION AGENTS, by John C. Nixon and Melvin A. Cook. Utah. Engineering Experiment Station, Salt Lake City, Utah. May 1950. 50p photos, diagrs, graphs, tables Available from The Director, Utah Engineering Experiment Station, Salt Lake City, Utah. PB 103997

1. Fluorite 2. Fluorite - Heat treatment 3. Oleic acid - Use in fluorite recovery 4. UU EES B47.

Bulletin no. 47. Bulletin of the University of Utah, vol. 40, no. 14.

FUMIGATION WITH ETHYLENE OXIDE: PRECAUTIONARY MEASURES. Gt. Brit. Home Office. Feb 1951. 12p diagrs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 103785

1. Ethylene oxide - Uses - Gt. Brit.

ISOMERIZACION CATALITICA DE PINENO EN CANFENO MEDIANTE EL EMPLEO DE ARCILLAS NACIONALES ACTIVADAS (CATALYTIC ISOMERIZATION OF PINENE INTO CAMPHENE THROUGH THE USE OF ACTIVATED CLAYS), por Aldo Emilio Antonio Mitta Ildefonse Alvarez. Argentine Republic. Ministerio de Industria y Comercio. Subsecretaria de Industria y Contralor Commercial. Direction General de Industria Manufacturera. Instituto Technologico. 1950. 18p tables (Text in Spanish) Mi $1.75, Ph $2.50. PB 103570

1. Pinene - Catalysis - Argentine Republic 2. Camphene - Argentine Republic 3. Clay, Activated - Uses - Argentine Republic.

Serie A, numero 5.

ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

Communication Equipment

COMPARISON OF MODULATION METHODS IN THE PRESENCE OF MULTIPATH TRANSMISSION, by H. F. Meyer and A. H. Ross. U. S. Camp Coles Signal Laboratory, Red Bank, N. J. Jul 1949. 39f photo,

diagrs, graphs, tables Mi $2.25, Enl Pr $6.25.
PB 104211

A comparison was made of radio modulation methods in the presence of multipath transmission. Voice modulation methods were tested over a radio circuit under conditions favoring multipath transmission, and results obtained indicate that amplitude modulation with exalted carrier reception provided the best communication, as judged by intelligibility tests, with phase modulation received on exalted carrier circuits being second best. Carefully prepared word lists recorded on phonograph records were used to modulate the multipath transmission simulator using amplitude, frequency, and phase modulation. Comparison of the results with the distortion predicted by the mathematical investigation shows that reasonable good correlation was obtained. Dept. of the Army project: 3-99-12-021. Signal Corps project: 132A. SCEL ER E-1041.

INVESTIGATION OF AIR-TO-AIR AND AIR-TO-GROUND ELECTROMAGNETIC PROPAGATION. INTERIM ENGINEERING REPORT NO. 5 ON CONTRACT NO. AF33(038)-1091. Cornell University. School of Electrical Engineering, Ithaca, N. Y. Oct 1949. 65f diagrs, graphs Mi $3.00, Enl Pr $10.00. PB 104198

Air-to-air and air-to-ground electromagnetic propagation in wavelengths between 10 m and 1 mm is being investigated. A comprehensive bibliography of publications relating to the problem is being compiled. The behavior of a wave upon reflection from the earth and the possibility of elevated inversion layers in the atmosphere guiding radio waves are being considered. A theory of tropospheric radio propagation based on the scattering of radio waves in a turbulent medium is given in detail. The theory explains the slow decrease of mean field strength with distance experienced at ranges beyond the horizon and also predicts the fading range at shorter distances, and the speed of fading at all ranges.

NOTE ON COMPARISON OF RANGES OF RADIO SET SCR-615-B AND RADAR SET AN/TPS-10A FOR STORM DETECTION, by Pauline M. Austin. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1947. 12p photos, graph, tables Mi $1.75, Ph $2.50. PB 104278

1. Radio range 2. SCR-615-B (Radio set) 3. AN/TPS-10A (Radar set) 4. Radar, Meteorological 5. SIG Contract W36-039-sc-32038, Report no. 5.

Weather radar research. Technical report no. 5. under Contract W36-039-sc-32038.

ON THE MECHANICS OF MAGNETIC AMPLIFIER OPERATION, by R. A. Ramey. U. S. Naval Research Laboratory. Jan 1951. 29p diagrs, graphs Available from Office of Technical Services. U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 104106

A new theory of magnetic amplifier operation, developed at this Laboratory, is presented. An elementary quasi-mathematical approach is used to demonstrate the application of this theory to known circuits. The method of analysis is also used to demonstrate a few of the new circuits which have been predicted by utilization of this new theory. These new circuits have characteristics which are in many ways, far superior to those of the magnetic amplifier circuits in use today. NRL R3799.

RICHTLINIEN ÜBER ERRICHTUNG VON EINWANDFREI FUNKENTSORTEN MARINE-NACHRICHTEN ANLAGEN AM LAND (OUTLINE OF ERECTION ON LAND OF MARINE COMMUNICATIONS FREE FROM SPARK INTERRUPTION) 2. AUSGABE. Aug 1941. 10f (Text in German) Mi $1.25, Enl Pr $2.50.
PB 103822

1. Radio, Marine - Land-based - Germany 2. Micro NAVSHIPS E120-46.

Anlage zu NWaIIID nr.13032. PG6799.

TELEPRINTER RADIO LINKS FOR LAND OPERATION. REPORT OF DEMONSTRATION BY GERMAN OFFICERS, ACCOMPANIED BY INSTRUCTION MANUAL AND PARTS LIST FOR WTZ-4 DOUBLE-TONE UNIT, by E. Hanna. Dec 1945. 55f photos, drawing, diagrs Mi $2.75, Enl Pr $8.75. PB 104022

1. WTZ-4 (Double-tone telegraph equipment) 2. Telegraphy, Double-tone - Germany 3. Micro NAVSHIPS E125-46.

Some frames will not reproduce well.

ÜBER DIE ERSTAUSFÜHRUNG TYPE HB 14 EINES RESOTANKS (ON THE EARLY MODEL TYPE HB14 OF A GENERATOR FOR MICROWAVES), by W. Dällenbach. Jun 1943. 3f drawing, diagrs (Text in German) Mi $1.25, Enl Pr $1.50.
PB 103830

1. Radio waves - Propagation - Germany 2. HB 14 (Microwave generator) 3. Micro NAVSHIPS E911-46.

From Hochfrequenztechnik und electroakustik bd. 61, hft. 6, Juni 1943.

VORLÄUFIGE BESCHREIBUNG UND BETRIEBSVORSCHRIFT FÜR NOTSENDEGERÄT. KURZBEZEICHNUNG: NSG2 (PRELIMINARY DESCRIPTION AND OPERATING INSTRUCTIONS FOR EMERGENCY TRANSMITTER. ABRIDGED. NSG2). Feb 1941. 26f photos, drawing (Text in German) Mi $2.00, Enl Pr $5.00. PB 103825

1. NSG2 (Transmitter) 2. Transmitters - Germany 3. Micro NAVSHIPS E175-46.

Electronics

BERICHT ZUM AUFTRAG SS6133/1666/43: BERECHNUNGS-INDEX VON KRS5 UND KRS6 (REPORT ON ORDER SS6133/1666/43: REFRACTIVE INDEX OF KRS5 AND KRS6 (MATERIALS PERMEABLE BY INFRARED RAYS), by Dr. Hettner. Jena. Universität. Theoretisch-Physikalisches Institut. Dec 1944. 3f table (Text in German) Mi $1.25, Enl Pr $1.50.
PB 103826

1. KRS 5 (Trade name) 2. KRS 6 (Trade name) 3. Refraction indexes - Germany 4. Infrared - Permeability - Germany 5. Infrared absorption - Germany 6. Micro NAVSHIPS E433-46.

Accompanied by letter of transmittal from Germany Reichsluftfahrtministerium. Forschungsführung.

BROADBAND COMPONENTS. FINAL REPORT ON BROADBAND WAVE GUIDE COMPONENTS INVESTIGATION INCLUDING HANDBOOK OF MAGNETIC POLARIZABILITIES, PREPARED FOR DEPT. OF THE ARMY, SIGNAL CORPS ENGINEERING LABORATORIES, SQUIER SIGNAL LABORATORY, FORT MONMOUTH, N. J. ON CONTRACT NO. W36-039-SC-38246. Sperry Gyroscope Co., Inc., Great Neck, N. Y. May 1950. 131p photos, fold diagrs, fold graphs Mi $5.50, Ph $17.50. PB 104095

The development of a broadband flexible waveguide of the vertebrae type is described. The resulting

unit for RG-51/U waveguide permits distortion in shear, twist, elongation and compression with low VSWR's. The importance of maintaining uniform displacements from one vertebra to the next is emphasized. A waveguide-to-coaxial-line transition was developed based upon the use of ridge waveguide as a stepped transformer. A method was applied in which the critical parameters were first adjusted for optimum performance individually and then combined in the final phase of the design. A maximum VSWR of 1.31 was obtained over the waveguide band. The details of a ninety-degree polarization converter only a half-wavelength long are described. This component may be used as a compact waveguide twist, or as a band-pass filter. In its simplest form it utilizes a square cavity and a resonant diagonal post, and it derives its broadband behavior from the triple-resonant interaction of these elements. The maximum theoretical bandwidth was reached in a practical unit for 1-1/4-inch by 5/8-inch waveguide. An investigation of aperture coupling is discussed in this report. The magnetic polarizabilities of various useful aperture shapes were determined experimentally by an electrolytic-tank method. The insertion loss and VSWR of numerous apertures in a waveguide were measured for various wall thicknesses. An extension to small-aperture theory was made which permits computation of the susceptance, insertion loss, and VSWR for large apertures in a transverse diaphragm in a waveguide. The graphical data and design formulas are collected in a "Handbook of Magnetic Polarizabilities and Aperture Design Information" which is included as Appendix B of this report. Dept. of the Army project: 3-26-00-600. Signal Corps project: 32-2006-3. Sperry report 5224-1188. See also PB 98293, 98293s, 101755.

DEVELOPMENT OF A SEALED VARIABLE AIR-GAP CRYSTAL HOLDER. MILLER, AUGUST E., LABORATORIES, NORTH BERGEN, N. J. FINAL REPORT UNDER CONTRACT NO. W36-039-SC-32378. 1947. 54p photos, drawings (part fold) Mi $2.75, Ph $7.50. PB 104130

This report covers the manufacturing details and the special jigs and tools which were built to produce the components of the unit commercially. It also includes a jig for the production method of assembling the parts. The blue-prints and the photographs show all of the details necessary for manufacturing the unit and operating it.

DEVELOPMENT OF CRYSTAL MIXERS AND TUNABLE HOLDERS FOR CRYSTAL DETECTORS. FINAL ENGINEERING REPORT UNDER CONTRACT W28-099-AC-147, PREPARED FOR WATSON LABORATORIES, RED BANK, N. J. Sperry Gyroscope Co., Great Neck, N. Y. May 1949. 93f diagrs, graphs, table Mi $4.25, Enl Pr $13.75. PB 104195

A series of broad-band crystal mixers and detectors for use in the frequency range between 2600 and 39000 mc has been developed. Variations among crystals of the same type were investigated, and an equivalent circuit for a crystal rectifier was developed for qualitative analysis of crystal admittance behavior. Factors to be considered in selecting a crystal type for operation in a given range of frequencies were determinedd. The admittance of a crystal when used as a mixer was compared with its admittance when used as a detector. Techniques for admittance measurements of crystals and a design procedure for both tuned and untuned crystal mixers were developed, and the problem of local oscillator injection and i-f filters was considered. Full coverage of each specified frequency band was achieved using only a single holder. Sperry engineering report 5224-1144.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. FIRST QUARTERLY REPORT, 5 MAY 1947 TO SEP 1947 ON CONTRACT NO. W36-039-SC-33659. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Sep 1947. 22p photos, drawings Mi $2.00, Ph $3.75. PB 104180

1. Circuits, Electronic - Printed 2. Coatings, Metallic 3. SIG Contract W36-039-sc-33659 Report no. 1.

For 2d-6th reports see PB 104181-104185. For final report see PB 102548.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. SECOND QUARTERLY REPORT, 15 SEPT TO 14 DEC 1947. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Dec 1947. 8p drawing Mi $1.25, Ph $1.25. PB 104181

1. Circuits, Electronic - Printed 2. Coatings, Metallic 3. SIG Contract W36-039-sc-33659 Report no. 2.

For 1st, 2d-6th reports see PB 104180, 104182-104185. For final report see PB 102548.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. THIRD QUARTERLY REPORT, 15 DEC 1947 TO 14 MAR 1948. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Mar 1948. 10p drawings Mi $1.25, Ph $1.25. PB 104182

1. Circuits, Electronic - Printed 2. Coatings, Silver halide 3. SIG Contract W36-039-sc-33659 Report no. 3.

For 1st-2d, 4th-6th reports see PB 104180-104181, 104183-104185. For final report see PB 102548.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. FOURTH QUARTERLY REPORT, 15 MAR 1948 TO 15 JUNE 1948. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Jun 1948. 8p photo, drawings Mi $1.25, Ph $1.25. PB 104183

1. Circuits, Electronic - Printed 2. Resistors, Graphite 3. Films, Hydrocarbon 4. SIG Contract W36-039-sc-33659 Report no. 4.

For 1st-3d, 5th-6th reports see PB 104180-104182, 104184-104185. For final report see PB 102548.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. FIFTH QUARTERLY REPORT, 15 JUNE 1948 TO 15 SEP 1948. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Sep 1948. 7p photo, table Mi $1.25, Ph $1.25. PB 104184

1. Circuits, Electronic - Printed 2. Films, Hydrocarbon 3. SIG Contract W36-039-sc-33659 Report no. 5.

For 1st-4th, 6th reports see PB 104180-104183, 104185. For final report see PB 102548.

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS. SIXTH QUARTERLY REPORT 15 SEP 1948 TO 15 JAN 1949. Kenyon Instrument Co., Inc., Huntington Station, N. Y. Dec 1948. 2p Mi $1.25, Ph $1.25. PB 104185

1. Circuits, Electronic - Printed 2. SIG Contract W36-039-sc-33659 Report no. 6.

For 1st-5th reports see PB 104180-104184. For final report see PB 102548.

DURCHLÄSSIGKEIT DÜNNER METALLPLATTEN FÜR ULTRASCHALL IN WASSER (PERMEABILITY OF THIN METAL PLATES TO ULTRASONIC VIBRATIONS IN WATER). Allgemeine Elektrizitäts Gesellschaft A. G., Berlin. 1943. 6p graphs (Text in German) Mi $1.25, Enl Pr $2.50. PB 103984

1. Vibration, Supersonic frequency - Germany 2. Micro BIOS FD 1044/50, Frames 1-5.

Laborbericht 2647. Abstract available as PB 103984s 1p. Mi $1.25, Ph $1.25.

ELECTRONIC DIFFERENTIAL ANALYZER, by A. B. Macnee. Massachusetts Institute of Technology. Research Laboratory of Electronics. Dec 1948. 45f diagrs, graphs Mi $2.50, Enl Pr $7.50. PB 103912

1. Analyzers, Differential 2. SIG Contract W-36-039-sc-32037. 3. MIT RLE TR 90.

Dept. of the Army project: 3-99-10-022. Signal Corps project: 102B.

FINAL REPORT, ARMY SIGNAL CORPS, CONTRACT NO. W-36-039-SC-32283. Northwestern University. Microwave Laboratory, Evanston, Ill. Apr 1949. 349p photos, drawings, graphs, tables Mi $9.00, Ph $43.75. PB 104131

Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O. Contents: I. Mode multiplexing, by W. A. Hughes. - II. Two-mode open-ended waveguide radiator, by H. D. Ross. - III. Matching sections in waveguides, by R. A. Woodson. - IV. Preliminaty research in microwave optics, by H.F. Mathis. V. Fundamental research in microwave optics, by R.A. Woodson. - VI. Dielectric prisms in open-ended waveguides, by H.F. Mathis. - VII. Septate coaxial waveguide, by M.M. Astrahan. - VIII. Reflecting discs on open-ended waveguides, by M.M. Astrahan. - IX. Waveguide equipment, sec. 1: Two-mode carriage and probe, by W.A. Hughes; sec. 2: Slotted line sections for determining the VSWR in a double mode waveguide, by H. D. Ross; sec 3: Matched phase shifter, by R.A. Woodson; sec. 4: Low-reactance attenuator, by R.A. Woodson. X. Field measuring equipment, sec. 1: Radiation pattern plotter, by W.C. Jakes, Jr. and H.D. Ross; sec. 2: Phase front plotter, by H.F. Mathis; sec 3: Sampling probes, by M.M. Astrahan and R.A. Woodson. - XI. Signal sources, sec. 1: Frequency stabilization, by W.C. Jakes, Jr.; sec. 2: Description of klystron power supply, by D. G. Harman.

FIVE WEATHER RADAR FLIGHTS: MEASUREMENT AND ANALYSIS, by Robert M. Cunningham and Robert W. Miller. Massachusetts Institute of Technology. Dept. of Meteorology. Dec 1948. 118p photos, maps, diagrs Mi $4.75, Ph $15.00. PB 104280

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038, Report no. 7.

Weather radar research. Technical report no. 7 under Contract W36-039-sc-32038. Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O.

FUNDAMENTAL RESEARCH ON RAW MATERIALS USED FOR ELECTRON EMISSIVITY ON INDIRECTLY HEATED CATHODES. FIRST ENGINEERING REPORT, 1 JULY TO 1 OCTOBER 1950 ON CONTRACT NOBSR-49138, INDEX NO. NE-111609, by James Cardell. Raytheon Manufacturing Co., Newton, Mass. Oct 1950. 32p graphs, tables Mi $2.25, Ph $5.00. PB 103646

A comparison of the low field and pulse emission obtainable from the standard, semi-purified and purified diode structures during life test burning indicates that the purer structures give correspondingly lower thermionic emission. Carbonates contaminated with carbon and processed in the purified diode did not show any advantage in the production of emission. Exploratory work with magnesium films on nickel cathodes gave unsatisfactory results. A comparison of getters in the purified diode is on life. A comparison of heavy vs light-walled cathodes is also under way. The electropolishing procedure for treating cathodes and the method used in the preparation of two series of carbonates are reported. A method for the determination of the concentrations of barium and strontium on nickel sleeves has been successfully developed. A summary of the Raytheon-ONR Conference held at Massachusetts Institute of Technology on 14 and 15 September 1950 indicates the general scope and character of the discussions.

GROUP OF GRAPHS SHOWING ESTIMATED RADAR RETURN FROM PRECIPITATION, by Pauline M. Austin. Massachusetts Institute of Technology. Dept. of Meteorology. Apr 1948. 26p photos, graphs (part fold), table Mi $2.00, Ph $3.75. PB 104279

1. Radar, Meteorological 2. Precipitation 3. Snow measurements - Radar 4. SIG Contract W36-039-sc-32038, Report no. 6.

Weather radar research. Technical report no. 6 under Contract W36-039-sc-32038.

INTERACTION OF AN ELECTRON AND A LATTICE OSCILLATOR, by E. P. Gross. Massachusetts Institute of Technology. Laboratory for Insulation Research. May 1951. 27p graphs Mi $2.00, Ph $3.75. PB 104425

1. Electron theory 2. Electrons - Lattice interaction 3. Electrons - Energy 4. Oscillators, Electron tube 5. Oscillators, Lattice 6. MIT LIR TR44.

O.N.R. Contract N5 ori-07801.

MAGNETRONS FOR PRODUCTION OF CENTIMETER WAVE LENGTH RADIATION, ALSO ABSORPTION OF SUCH RADIATION IN WATER VAPOR COLUMBIA UNIVERSITY. COLUMBIA RADIATION LABORATORY, NEW YORK CITY, N. Y. FINAL REPORT ON OSRD CONTRACT OEMSR-485. Apr 1946. 199p photos, drawings, diagrs, graphs, tables Mi $7.00, Ph $25.00. PB 103866

1. Vacuum tubes, Magnetron 2. Radar - K-bands 3. Radio waves - Absorption 4. NDRC 14-588.

MISCELLANEOUS BY-PRODUCTS RESULTING FROM THE AIRBORNE RADAR CONTRACT WORK, by R. W. Ayer. American Airlines System, New York N. Y. Sep 1949. 7f Mi $1.25, Enl Pr $2.50. PB 104204

A number of miscellaneous by-products which resulted from airborne contract work are listed and briefly explained. They include radar training with photographs, close-in beacon operation, ice avoidance, the effect of beacon-radar cross polarization, snow detection, ground speed, size of damaging hail, erroneous beacon range indication, flap attenuator, and others. Tests indicate that 20 degrees of cross polarization do not noticeably affect beacon operation. Usefulness of radar for determining quickly the ground speed of aircraft was demonstrated. Terrain-collision warning, using the radio altimeter, was investigated. It was concluded that aircraft antenna should be mounted in the nose, in order to reduce to minimum any deviations from the proper aerodyna-

mic contour. Contract no. NOa(s)9006. Final report on miscellaneous items not listed under the contract tasks.

PREVENTION OF OSCILLATION IN CATHODE FOLLOWERS, by Herbert L. Krauss and Philip F. Ordung. Yale University, New Haven, Conn. Oct 1950. 24p diagrs, graphs Mi $2.00, Ph $3.75. PB 104297

This paper reviews the methods previously used or proposed to prevent unwanted oscillations, and two new approaches to the problem. Dept. of the Army project: 3-99-12-022. Signal Corps project: 132B. SIG Contract W36-039-sc-33649 Research report no. 15.

PROGRESS REPORT NO. IX ON O.N.R. CONTRACTS N5 ORI-07801, N5ORI-07858. Massachusetts Institute of Technology. Laboratory for Insulation Research. May 1951. 63p drawings, diagrs, graphs, table Mi $3.00, Ph $8.75. PB 104335

1. Crystallography, X-ray 2. Dielectrics - Breakdown theory 3. Conductors, Semi - Ferromagnetic 4. Spectroscopy, Dielectric.

PROGRESS REPORT, JANUARY-MARCH 1951. National Research Council of Canada. Radio and Electrical Engineering Division. Apr 1951. 43p photos, diagrs, drawings, graphs Mi $2.50, Ph $6.25. Limited supply also available free from National Research Council of Canada, Ottawa, Canada. PB 104346

1. Radiophysics - Canada 2. Engineering, Electrical - Canada 3. Radar - Canada 4. Electronics - Canada 5. Navigational aids - Canada 6. NRCC ERA 204.

PROPOSAL FOR UHF AIRCRAFT TRANSCEIVER FOR AIR MATERIAL COMMAND. Air Associates, Inc., Teterboro, N. J. Jun 1949. 28f drawings, diagrs Mi $2.00, Enl Pr $5.00. PB 104207

The basic design and performance characteristics are proposed of a four-channel, crystal-controlled, UHF airborne transceiver, operating in the frequency range of 225 to 400 megacycles. General specifications are outlined for the components of the system. Performance specifications for the transmitter and receiver and the theory of operation of the turret oscillator and doubler, transmitter, receiver, audio system, and channel selector are given. Outline drawings of the transceiver unit and control box and a schematic diagram of the channel-selector circuit are shown.

ROLE OF INHIBITOR FILMS IN ELECTRODE PROCESSES. FINAL REPORT UNDER CONTRACT N7-ONR-329, TASK ORDER I, by Hugh J. McDonald, R. B. Bernstein, G. A. Marsh and R. D. Misch. Illinois Institute of Technology. Dept. of Chemistry. Corrosion Research Laboratory. Aug 1948. 44p drawing, graphs, tables Mi $2.50, Ph $6.25. PB 104378

1. Inhibitors, Corrosion 2. Polarizers, Pulse 3. Polarizers, Scope 4. Hydrogen - Electrodeposition 5. Cathodes, Palladium

SPEED OF RESPONSE OF THE CATHODE-COUPLED CLIPPER, by Philip F. Ordung and Herbert L. Krauss. Yale University, New Haven, Conn. Aug 1950. 24p drawings, diagrs, graphs Mi $2.00, Ph $3.75. PB 104296

This paper discusses the factors affecting the speed of response of the cathode-coupled clipper circuit when it is driven by essentially rectangular pulses. The transient build-up time for the circuit tested is shown to be approximately 50 millimicroseconds, indicating that sine waves with frequencies as high as 10 megacycles could be clipped with fair waveform. Oscillograms of the various voltages present in the clipper circuit are given. Dept. of the Army project: 3-99-12-022. Signal Corps project: 132B. SIG Contract W36-039-sc-33649, Research report no. 14.

STUDY OF BIMETALLIC MAGNETOSTRICTIVE TRANSDUCERS FOR ATMOSPHERIC OPERATION ABOVE 50 KILOCYCLES PER SECOND, BY LEWIS BALAMUTH, M. U. COHEN, DAVID BUSKIN, AND JOHN F. BRADY. BALCO RESEARCH LABORATORIES, NEWARK, N. J. FINAL REPORT ON CONTRACT NO. W36-039-sc-32143. Feb 1947. 105p diagrs, graphs, tables Mi $4.50, Ph $13.75. PB 104070

This report describes the development of a bimetallic magnetostrictive transducer designed for use in air in the supersonic region above 50 kc. The bimetallic transducer has as one of its elements a magnetostrictive metal and is driven at its longitudinal resonant frequency by an electronic oscillator. Because of its bimetallic nature the transducer may be designed so that there is strong coupling between its longitudinal modes and its flexural modes of vibration, with a consequent increase of sonic output. The theory of the design of such transducers is developed in this report. Experimental transducers have been constructed and operated in the region of 50 kc. Good reproducibility and stable operation may be achieved. The Q's of the experimental transducers are about 250, and the beam widths are strongly affected by diffraction effects. There are serious theoretical and experimental limitations on the bandwidth and efficiency of such transducers when used for operation in air. Possible methods of minimizing the effects of these theoretical limitations are discussed including the use of thin, specially shaped vibrators. Combined piezoelectric and magnetostrictive solid vibrators are suggested as an outgrowth of the work reported here. The study of gaseous transducers and of a novel liquid transducer is further suggested for increased efficiency. For supplement see PB 104070s.

STUDY OF BIMETALLIC MAGNETOSTRICTIVE TRANSDUCERS FOR ATMOSPHERIC OPERATION ABOVE 50 KILOCYCLES PER SECOND, BY LEWIS BALAMUTH, M. U. COHEN, DAVID BUSKIN, AND JOHN F. BRADY. BALCO RESEARCH LABORATORIES, NEWARK, N. J. SUPPLEMENT TO FINAL REPORT ON CONTRACT NO. W36-039-sc-32143. Aug 1947. 29p diagrs, tables Mi $2.00, Ph $3.75. PB 104070s

Supplement to PB 104070.

STUDY OF PRINTED RESISTORS FOR PRINTED CIRCUITS, BY LEWIS BALAMUTH, M. U. COHEN, ARTHUR U. KOPPEL, KENNETH HOFFMANN AND SOL POLTARACK. BALCO RESEARCH LABORATORIES, NEWARK, N. J. FINAL REPORT ON CONTRACT NO. W-36-039-sc-38136. Aug 1949. 180p drawings, diagrs, graphs, tables Mi $6.50, Ph $22.50. PB 104072

This report presents the results of laboratory investigation and research leading to the development

of leadless printed resistor elements suitable for incorporation into printed circuits. The work centered around two principle types of elements. One type was a cylindrical body of sub-miniature size with a resistive film coating on the surface of the cylinder, this coating in turn being covered with a protective layer of a silicone type formulation. These elements were provided with metallized tinned terminations permitting direct solderability to printed wiring. The other type of resistor element was of annular disc-like shape and was developed for direct soldering as a coaxial resistor into a coaxial line. The very requirement of direct solderability required that the resistors be capable of withstanding more elevated temperatures than provided for in the current JAN-R-11 specifications. Dept. of the Army project no. 3-99-15-022. Signal Corps project: no. 152B.

STUDY OF THE GENERATION AND DETECTING OF ELECTROMAGNETIC WAVES IN THE MILLIMETER WAVE REGION, BY J. H. ROHRBAUGH. NEW YORK UNIVERSITY, NEW YORK, N. Y. REPORT NO. 3 MAR 1, 1949 TO MAY 31, 1949 UNDER CONTRACT AF 19(122)-4. Jun 1949. 16f diagrs Mi $1.75, Enl Pr $3.75. PB 104222

Progress made in the development of devices for the generation and detection of electromagnetic waves in the millimeter wave region is outlined. Absorption measurements were made of the high harmonics produced by a K-band magnetron, and optimum conditions of magnetron operation from the standpoint of high-harmonic generation are being investigated. Experiments are being made in connection with the produc- of high K-band harmonics, using a crystal generator and spectrum analyzer. A complete bolometer detector and amplifying system has been built and preliminary tests are satisfactory. A furnace for the construction of dipole sources in a reducing atmosphere has been constructed.

WEATHER RADAR RESEARCH. FIFTH PROGRESS REPORT, COVERING THE PERIOD FROM NOV 15, 1946 THROUGH FEB 14, 1947, by Alan C. Bemis. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1947. 4p Mi $1.25, Ph $1.25. PB 104266

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 5.

WEATHER RADAR RESEARCH. SIXTH PROGRESS REPORT, COVERING THE PERIOD FROM FEB 15, 1947 THROUGH MAY 14, 1947, by Alan C. Bemis. Massachusetts Institute of Technology. Dept. of Meteorology. May 1947. 5p Mi $1.25, Ph $1.25. PB 104267

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 6.

WEATHER RADAR RESEARCH. SEVENTH PROGRESS REPORT, COVERING THE PERIOD FROM MAY 15, 1947 THROUGH AUG 14, 1947, by Alan C. Bemis. Massachusetts Institute of Technology. Dept. of Meteorology. Aug 1947. 4p. Mi $1.25, Ph $1.25. PB 104268

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 7.

WEATHER RADAR RESEARCH. EIGHTH PROGRESS REPORT, COVERING THE PERIOD FROM AUG 15, 1947 THROUGH NOV 14, 1947. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1947. 12p photos, fold diagr Mi $1.75, Ph $2.50. PB 104269

1. Radar, Meteorological 2. SIG Contract W36-039-sc 32038 Progress report no. 8.

WEATHER RADAR RESEARCH. NINTH PROGRESS REPORT, COVERING THE PERIOD FROM NOV 15, 1947 THROUGH FEB 14, 1948. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1948. 12p Mi $1.75, Ph $2.50. PB 104270

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 9.

This report is a summary of first two years of operation.

WEATHER RADAR RESEARCH. TENTH PROGRESS REPORT, COVERING THE PERIOD FROM FEB 16, 1948 THROUGH MAY 14, 1948. Massachusetts Institute of Technology. Dept. of Meteorology. May 1948. 10p Mi $1.25, Ph $1.25. PB 104271

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 10.

WEATHER RADAR RESEARCH. ELEVENTH PROGRESS REPORT, COVERING THE PERIOD FROM MAY 15, 1948 THROUGH AUG 14, 1948. Massachusetts Institute of Technology. Dept. of Meteorology. Aug 1948. 11p Mi $1.75, Ph $2.50. PB 104272

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038, Progress report no. 11.

WEATHER RADAR RESEARCH. TWELFTH PROGRESS REPORT, COVERING THE PERIOD FROM AUG 15, 1948 THROUGH NOV 14, 1948. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1948. 10p photo Mi $1.25, Ph $1.25. PB 104273

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 12.

Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O.

WEATHER RADAR RESEARCH. THIRTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM NOV 15, 1948 THROUGH FEB 14, 1949. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1949. 8p Mi $1.25, Ph $1.25. PB 104274

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038, Progress report no. 13.

WEATHER RADAR RESEARCH: FOURTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM FEBRUARY 15, 1949 THROUGH MAY 15, 1949. Massachusetts Institute of Technology. Dept. of Meteorology. May 1949. 13p diagrs, graphs Mi $1.75, Ph $2.50. PB 104133

1. Radar, Meteorological 2. Weather reconnsissance, Radar 3. SIG Contract W36-039-sc-32038, Report no. 14.

Department of the Army Project: 3-99-05-022. Signal Corps Project: 122B-O. For 15th - 18th reports see PB 104134-PB 104137.

WEATHER RADAR RESEARCH: FIFTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM MAY 15, 1949 THROUGH AUGUST 14, 1949. Massachusetts Institute of Technology. Dept. of Meteorology. Aug 1949. 15p photo, graphs Mi $1.75, Ph $2.50. PB 104134

1. Radar, Meteorological 2. Weather reconnaissance, Radar 3. SIG Contract W36-039-sc-32038, Report no. 15.

Department of the Army Project: 3-99-05-022. Signal Corps Project: 122B-O. For 14th, 16th - 18th reports see PB 104133, PB 104135 - PB 104137.

WEATHER RADAR RESEARCH: SIXTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM AUGUST 15, 1949 THROUGH NOVEMBER 14, 1949. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1949. 11p Mi $1.75, Ph $2.50. PB 104135

1. Radar, Meteorological 2. Weather reconnaissance, Radar 3. SIG Contract W36-039-sc-32038, Report no. 16.

Department of the Army Project: 3-99-05-022. Signal Corps Project: 122B-O. For 14th - 15th, 17th - 18th reports see PB 104133 - PB 104134, PB 104136 - PB 104137.

WEATHER RADAR RESEARCH: SEVENTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM NOVEMBER 15, 1949 THROUGH FEBRUARY 14, 1950. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1950. 10p Mi $1.25, Ph $1.25. PB 104136

1. Radar, Meteorological 2. Weather reconnaissanee, Radar 3. SIG Contract W36-039-sc-32038, Report no. 17.

Department of the Army project: 3-99-05-022. Signal Corps Project: 122B-O. For 14th - 16th, 18th reports see PB 103133 - PB 104135, PB 104137.

WEATHER RADAR RESEARCH: EIGHTEENTH PROGRESS REPORT, COVERING THE PERIOD FROM FEBRUARY 15, 1950 THROUGH MAY 14, 1950. Massachusetts Institute of Technology. Dept. of Meteorology. May 1950. 14p graph Mi $1.75, Ph $2.50. PB 104137

1. Radar, Meteorological 2. Weather reconnaissance, Radar 3. SIG Contract W36-039-sc-32038, Report no. 18.

Department of the Army project: 3-99-05-022. Signal Corps Project: 122B-O. For 14th - 17th reports see PB 104133-PB 104136.

WEATHER RADAR RESEARCH. PROGRESS REPORT NO. 19, COVERING THE PERIOD FROM MAY 15, 1950 THROUGH AUG 14, 1950. Massachusetts Institute of Technology. Dept. of Meteorology. Aug 1950. 12p Mi $1.75, Ph $2.50. PB 104275

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 19.

Dept. of the Army project: 3-99-05-022. Signal Corps project: 122B-O.

WEATHER RADAR RESEARCH. PROGRESS REPORT NO. 20, COVERING THE PERIOD FROM AUG 15, 1950 THROUGH NOV 14, 1950. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1950. 11p Mi $1.75, Ph $2.50. PB 104276

1. Radar, Meteorological 2. SIG Contract W36-039-sc-32038 Progress report no. 20.

Dept. of the Army project: 3-99-05-022. Signal Corps project: 22-122 B-O.

Generators, Motors, Transmission Distribution, and Allied Equipment

DEVELOPMENT OF WIRE WOUND RESISTORS. FINAL (6TH) REPORT UNDER CONTRACT NO. W36-039-SC-38148, NOV 10, 1949 TO MAR 31, 1950, by D. M. O'Halloran, F. D. Mitchell and John S. Shallcross. Shallcross Mfg. Co., Collingdale, Pa. Apr 1950. 16p photos, tables Mi $1.75, Ph $2.50. PB 104129

1. Resistors 2. Resistors, Cast 3. SIG Contract W36-039-sc-38148 Final report.

Army project: 3-26-00-600. Signal Corps project: 2006.

ENGINEERING PULSE TRANSFORMER RESEARCH. FINAL REPORT ON CONTRACT W-28-099-AC-195, BY C. K. HADLOCK AND I. GOLDSTEIN, PREPARED FOR AIR MATERIEL COMMAND, WATSON LABORATORIES, RED BANK, N. J. UNDER THE GENERAL DIRECTION OF L.M.K. BOELTER. California. University. Dept. of Engineering, Los Angeles, Calif. Apr 1948. 176p diagrs, graphs (part fold) tables Mi $6.50, Ph $22.50. PB 104075

This report deals with the application of a single isolated rectangular pulse to the input of an equivalent circuit of a step-up pulse transformer. This assumes, in effect, that for a series of pulses sufficient time elapses between successive pulses so that the transformer network has returned to its initial or unexcited state. An equivalent circuit representing a pulse transformer was derived, and the differential equations expressing the behavior of this circuit were formulated. This particular equivalent circuit is valid only for step-up transformers of turn ratios of 2 or greater. For step-down transformers, and for step-up transformers of turn ratios close to unity, it may be necessary to consider additional parameters. Solutions of these equations were obtained on the Differential Analyzer for a rectangular pulse input for various values of the circuit parameters (resistance, capacitance, and inductance). From these plotted solutions, the characteristics of the output pulse were measured and then tabulated as functions of the various circuit parameters. Comparison was made between these solutions and those presented by W. H. Bostick. Bostick treated the problem by dividing the output pulse into three parts; namely, leading edge, pulse top, and trailing edge or backswing, presenting different equivalent circuits and equations for each portion of the output pulse. In the present report, however, the transformer was treated as being represented by a single circuit which was applicable over the entire pulse interval. It was found that Bostick's solutions were in excellent agreement with those obtained by means of the Differential Analyzer, except for the shape of the leading edge. The equivalent circuit used in the present report included the effect of the interwinding capacitance, whereas in Bostick's work this effect is considered negligible. The effect of this capacitance is to produce a small transient oscillation in the leading edge of the pulse.

FINAL ENGINEERING REPORT, CONTRACT W33-038-AC-20801, COVERING ENGINEERING SERVICES IN CONNECTION WITH THE DEVELOPMENT AND FABRICATION OF MINIATURE AUDIO TRANSFORMERS OF THREE TYPES. Standard Electrical

Products Co., Dayton, Ohio. Jun 1951. 69p drawings, diagrs, graphs, tables Mi $3.00, Ph $8.75. PB 104352

1. Transformers, Audio - Miniaturization. Report no. LD48-14.

REPORT ON THE DEVELOPMENT OF TEST EQUIPMENT AND RESULTS OF TESTS IN CONNECTION WITH THE STUDY OF INSULATION OF SMALL POWER FREQUENCY TRANSFORMERS, COVERING THE PERIOD DEC. 1, 1948 TO FEB 28, 1949, ALSO A FINAL SUMMARY OF THE RESULTS OBTAINED FROM JUNE 1, 1946 to FEB 28, 1949, by Dr. Joseph S. Carroll. Stanford University. Dept. of Electrical Engineering. Ryan Laboratory, Stanford, Calif. Feb 1949. 90p photo, diagrs (1 fold) graphs Mi $3.75, Ph $11.25. PB 104088

1. Transformers, Power - Insulation - Tests 2. Transformers, Power - Insulation - Testing equipment 3. Transformers, Power - High temperature - Insulation - Tests 4. SIG Contract W36-039-sc-32159, Report no. 11.

Dept. of the Army project: 3-26-00-600. Signal Corps project: 2006. 11th report on Army contract no. W36-039-sc-32159.

TRANSFORMER DESIGN CRITERIA AND DATA (PART OF FINAL REPORT, TRANSFORMER DEVELOPMENT, HIGH FREQUENCY) PREPARED by P. A. Fessler, H. S. Lasher, Jr., H. W. Lord, Glenn Walters. General Electric Co., Research Laboratory, Schenectady, N. Y. June 1950. 239p diagrs, graphs, tables Mi $8.25, Ph $30.00. PB 104294

1. Circuits, Transformer - Design 2. SIG Contract W36-039-sc-38268 Final report, pt. 2 3. GE RL 417.

TRANSFORMER DEVELOPMENT, HIGH FREQUENCY. FINAL REPORT, 10 MAY 1950, PREPARED by P. A. Fessler, H. S. Lasher, Jr., H. W. Lord, Glenn Walters. General Electric Co., Research Laboratory, Schenectady, N. Y. Jun 1950. 166p photos, drawings, diagrs, graphs, tables Mi $6.25, Ph $21.25. PB 104293

1. Transformers, High frequency 2. Transformers, Audio - Miniaturization 3. Impregnants - Research 4. Distortion, Amplitude frequency 5. SIG Contract W36-039-sc-38268 Final report, pt. 1 6. GE RL 416.

Miscellaneous

BILDWANDLERROHR-ENTWICKLUNGEN (ICONOSCOPE DEVELOPMENTS), by W. Schaffernicht. Allgemeine Elektrizitäts Gesellschaft, Berlin. Jul 1944. 4f drawings, graphs (Text in German) Mi $1.25, Enl Pr $1.50. PB 104018

1. V-64 (Iconoscope) 2. Vacuum tubes, Iconoscope - Germany 3. Micro NAVSHIPS E486-46.

Some frames will not reproduce well.

GERMAN STANDARDS FOR WIRE AND CABLE SYNTHETIC SHEATHING. I. G. Farbenindustrie A. G., Schkopau, Ger. 1938-1944. 149f photo, drawings, diagrs, graphs, tables (Text in German) Mi $5.75, Enl Pr $20.00. PB 103887

1. Cables - Sheaths, Synthetic - Standards - Germany 2. Wire sheathing - Standards - Germany 3. Insulating materials - Tests - Germany 4. Micro BIOS FD 2363/47, Frames 1-176.

English abstract included. Abstract available as PB 103887s. 2p. Mi $1.25, Ph $1.25.

IMPROVED R. F. CONNECTORS. FINAL REPORT ON CONTRACT NO. W36-039-sc-38219 COVERING PERIOD JAN 15, 1949 TO JAN 15, 1951, PREPARED by Carl W. Concelman. Industrial Products Co., Danbury, Conn. Jan 1951. 178p photos, drawings (part fold) Mi $6.50, Ph $22.50. PB 104094

This report describes the factors entering into the design and development of three new series of coaxial cable connectors. Each series provides a complete selection of types including many new angle fittings and other combination types which will provide a saving of cost, space and weight. Essential mechanical and electrical test data, where applicable, are presented for most of the connectors. Dept. of the Army Project: no. 3-26-00-600. Signal Corps project no. 32-2006-3. IPC project no. SC-200.

ON THE THEORY OF ELECTRON WAVE TUBES, by Olof E. H. Rydbeck and Sven K. H. Forsgren. Chalmers University of Technology, Gothenburg, Sweden. 1951. 33p diagrs, graphs Mi $2.25, Ph $5.00. PB 103983

1. Tubes, Electron - Sweden 2. Chalmers University of Technology, Gothenburg, Sweden. Transactions no. 102 3. Chalmers University of Technology, Gothenburg, Sweden. Research Laboratory of Electronics. Report no. 15.

SAFETY AND REGULATION OF ELECTRIC FENCE CONTROLLERS FOR UTAH, by Arthur C. Jacquot. Utah. Engineering Experiment Station, Salt Lake City, Utah. Jun 1942. 46p diagrs, graph Available from The Director, Utah Engineering Experiment Station, Salt Lake City, Utah. PB 103973

1. Connectors, Electric 2. Fences, Electrified 3. UU EES B3.

Bulletin no. 3.

SOME PRACTICAL CONSIDERATIONS IN ATTIC FAN DESIGN. PART I: HOUSINGS, by D.W. Scoates. Texas. Engineering Experiment Station, College Station, Tex. May 1950. 15p diagrs, graphs Available from Texas Engineering Experiment Station, College Station, Tex. PB 103677

1. Fans, Axial flow - Design 2. Hunter Fan and Ventilating Company, Memphis, Tenn. 3. Moore Company, Kansas City, Mo. 4. TU EES RR 13.

SOME REMARKS ON THE ENERGY FLOW IN ROTATING ELECTRIC MACHINES, by F. Dahlgren. Sweden. Kungl. Tekniska Högskolan, Stockholm. 1950. 16p diagrs Mi $1.75, Ph $2.50. PB 103799

Certain points relating to the flow of electromagnetic energy in electric machines are dealt with under simplified assumptions. The main interest is directed to the relation of external reactive magnetization power to the transportation of the magnetic energy along the air-gap, and to the relatively of the conception of the energy flow across the air-gap under load conditions. Some apparent discrepancies relating to the Poynting radiation within the machine are explained. Acta polytechnica 70, Electrical engineering series vol. 3, nr. 3. Also issued as Kungl. Tekniska Högskolans. Handlingar nr. 38.

TWO CONTACT PLUG AND CORRESPONDING TWO CONTACT JACK ASSEMBLY. FINAL REPORT ON CONTRACT NO. W-36-039-SC-32284, JUN 5, 1946 TO MAY 28, 1948, by Isaac Mark, Jr. Barlow Elec-

trical Development Co., New York, N. Y. May 1948. 38p drawings (part fold), graph Mi $2.25, Ph $5.00. PB 103880

1. Plugs, Two-contact - Waterproof 2. SIG Contract W36-039-sc-32284, Final report.

WATER-PROOF MULTI-CONTACT CONNECTOR. FINAL REPORT ON CONTRACT NO. W36-039-SC-32295, JUNE 5, 1946 TO MAY 29, 1948, by Isaac Mark, Jr. Barlow Electrical Development Co., New York, N. Y. May 1948. 31p photo, drawings (part fold) Mi $2.25, Ph $5.00. PB 104066

1. Connectors, Electric - Waterproof 2. SIG Contract W36-039-sc-32295 Final report.

FOOD AND KINDRED PRODUCTS

PRINCIPLES OF THE DRYING PROCESS WITH SPECIAL REFERENCE TO VEGETABLE DEHYDRATION, by W. B. Van Arsdel. U. S. Western Regional Research Laboratory, Albany, Calif. Jan 1951. 91p photos, diagrs, graphs, tables Mi $4.25, Ph $12.50. Limited supply available free from the Western Regional Research Laboratory, Albany 6, Calif. PB 104345

1. Vegetables, Dehydrated - Processing.

AIC-300. Revision of the section entitled "Principles involved in the drying process", in U.S.D.A. Miscellaneous publication no. 540, "Vegetable and Fruid Dehydration, a Manual for Plant Operators", June 1944.

WHITE POTATOES IN JAPAN, by Ernest J. Wheeler. Supreme Commander for the Allied Powers. Natural Resources Section. May 1951. 41p photos, maps, diagrs, tables Mi $2.50, Ph $6.25. PB 104424

1. Potatoes, White - Production - Japan 2. SCAP NRS 142.

FUELS AND LUBRICANTS

BERICHT ÜBER DIE BEDEUTUNG DER CETANZAHL (SIGNIFICANCE OF THE CETANE NUMBER), by Kochler. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jun 1939. 21f photos, graphs (Text in German) Mi $2.00, Enl Pr $5.00. PB 104354

1. Fuels - Combustion - Germany 2. Fuels - Cetane number - Germany 3. Micro BIOS FD 2870/46, Item 98 frames 29233-29251.

Abstract available as PB 104354s. 1p. Mi $1.25, Ph $1.25. Tech. Prüfstand Oppau. Bericht nr. 385.

DRAWINGS OF MEDIUM PRESSURE REACTORS FOR THE FISCHER TROPSCH PROCESS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1942-1944. 103f drawings only (Legends in German) Mi $4.50 , Enl Pr $15.00. PB 104126

1. Fischer-Tropsch process 2. Reactors - Design - Germany 3. Micro BIOS FD 5422/47, Frames 1-18.

Abstract available as PB 104126s. 1p. Mi $1.25, Ph $1.25.

EMPLOYMENT OF NATURAL GAS FOR DOMESTIC AND INDUSTRIAL HEATING APPLIANCES, by A. Albrecht and Dipl.-Eng. Beck. Deutscher Normenauschuss E. V. Fachkommission Verwendung von Naturgas für Feuerstätten. 1947. 344f photos, drawings, diagrs, tables (Text in German) Mi $9.00, Enl Pr $46.25. PB 103888

1. Gas, Natural - Germany 2. Heating equipment, Domestic - Germany 3. Heating equipment, Industrial - Germany 4. Micro BIOS FD 2955/48, Frames unnumbered.

Abstract available as PB 103888s. 3p. Mi $1.25, Ph $1.25.

EXPERIMENTS FOR THE PRODUCTION OF AVIATION SPIRIT BY CATALYTIC CRACKING OF PRIMARY PRODUCTS OF THE FISCHER-TROPSCH SYNTHESIS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1937-1944. 396f drawings, graphs, tables (Text in German) Mi $9.00, Enl Pr $40.00. PB 104188

1. Fuels, Aviation - Production - Germany 2. Fischer-Tropsch process 3. Hydrocarbons - Cracking - Germany 4. Micro BIOS FD 5600/47, Frames 1-387.

Abstract available as PB 104188s. 2p. Mi $1.25, Ph $1.25.

FORSCHUNGSBERICHTE DER FACHGLIEDERUNG TRIEBSTOFFE IM REICHSFORSCHUNGSRAT, BD. III: MOTORISCHER TEIL (RESEARCH REPORTS OF THE FUEL RESEARCH SECTION OF THE NATIONAL RESEARCH COUNCIL, V. III: MOTIVE PART). Institut für Chemische Technologie, Munich. Sep 1941. 137f photos, drawings, graphs (Text in German) Mi $5.50, Enl Pr $18.75. PB 104353

1. Fuels, Automotive - Knocking - Germany 2. Fuels, Antiknock - Tests - Germany 3. Fuels, Diesel - Germany.

Contents: 1. Probleme der kraftstoff-bewertung (Problems of fuel evaluation) by A. W. Schmidt. - 2. Bewertung von dieselkraftstoffen (Evaluation of Diesel fuels) by Dr. Kneule. - Forschungsbericht über die weiterentwicklung des klopfmessgerätes (Research report on further development of knock-measuring instruments) by Paul Funck. - 4. Versuchsbericht über die anwendung der elektroakustischen klopfmessmethode an ein-und mehrzylindermotoren, auf dem prüfstand und im fahrbetrieb (Research report on use of the electroacoustic method of measuring knock on single-and several-cylindered engines, on the testing stand and in road tests) by Herbert Funck.

RAPPORT OVER HET WERK DER AFDEELING KC OP HET GEBIED VAN "PROPAANPEROXYDEN" EN ANDERE KOOLWATER-STOFPEROXYDEN GEDURENDE HET TWEEDE HALFJAAR 1940 (RESEARCH BY THE KC DEPARTMENT DURING THE SECOND HALF OF 1940 ON PROPANE PEROXIDES AND OTHER HYDROCARBON PEROXIDES) by C. Groeneveld and P. L. Kooijman. N.V. de Bataafsche Petroleum Maatschappij, Den Hagg. Feb 1941. 41f graphs (Text in Dutch) Mi $2.50, Enl Pr $7.50. PB 104186

1. Propane peroxides - Research - Netherlands 2. Ethane peroxides - Research - Netherlands 3. Methane peroxides - Research - Netherlands 4. Micro BIOS FD 2875/46, Item 7, Frames 003264-003304.

Abstract available as PB 104186s. 3p. Mi $1.25, Ph $1.25.

SYNTHESIS OF CYCLOPROPANE HYDROCARBONS FROM METHYLCYCLOPROPYL KETONE: III: 2-CYCLOPROPYL-1-BUTENE, CIS AND TRANS 2-CYCLOPROPYL-2-BUTENE, AND 2-CYCLOPROPYLBUTANE, by Vernon A. Slabey and Paul H. Wise. U. S. National Advisory Committee for Aeronautics. Jun 1951. 22p diagrs, graphs Mi $2.00, Ph $3.75. PB 104244

The hydrocarbons, 2-cyclopropyl-1-butene, cis and trans 2-cyclopropyl-2-butene, and 2-cyclopropylbutane were obtained in high purity and their physical properties and infrared spectra were determined. The olefins were isolated from the dehydration products of methylethylcyclopropylcarbinol which was prepared by the reaction of ethylmagnesium bromide with methylcyclopropyl ketone. Catalytic hydrogenation of the 2-cyclopropylbutenes yielded 2-cyclopropylbutane. For Parts I-II see PB 102604 and PB 102565. NACA TN 2398

TECHNIQUE OF THE FISCHER-TROPSCH PROCESS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1937-1944. 53f graphs, tables (Text in German) Mi $2.75, Enl Pr $8.75. PB 104171

1. Fischer-Tropsch process 2. Fischer-Tropsch plant, Ruhrchemie A. G. 3. Fischer-Tropsch plant, Rheinpreussen 4. Fischer-Tropsch plant, Essener Steinkohle 5. Gas - Synthesis - Germany 6. Micro BIOS FD 5619/47, Frames 1-43.

Abstract available as PB 104171s. 2p. Mi $1.25, Ph $1.25.

THERMODYNAMIC FUNCTIONS OF HALOGENS AND HYDROGEN HALIDES, by Rudolph Edse. U. S. Air Materiel Command. Technical Intelligence Division. Propulsion Section. Nov 1949. 51p tables Mi $2.75, Ph $7.50. PB 104304

Thermodynamic values of the halogens and hydrogen halides for the temperature range from 298° to 6000° K are presented in this report. These data permit the calculation of the theoretical performance of high energy rocket propellants utilizing the halogens. The method of calculating the thermodynamic functions from spectroscopic data, by means of statistical mechanics, is presented. Project no. HP-206. AAF TR 2250 IA.

WOOD FUEL: REPORT OF CONFERENCE AT PHILADELPHIA, MAY 10, 1951. Northeastern Wood Utilization Council, New Haven, Conn. May 1951. 75p photos, drawings, graphs, tables Available from Northeastern Wood Utilization Council, Inc., P. O. Box 1577, New Haven, Conn. $3.00. PB 104315

1. Wood as fuel 2. Fuel, Wood 3. Wood - Briquetting 4. Stoves, Wood - Gravity feed 5. Stokers, Wood 6. Stokers, Coal 7. Briquettes, Fuel 8. NWUC B 35.

Contents: - Foreword. p. 3. - Attendance. p. 5. - World wood fuel situation, by Henry I. Baldwin. p. 7. - Wood fuel in a national emergency, by Edgar L. Heermance. p. 9-13. - Characteristics of wood as fuel, by R.P.H. Miller. p. 15-18. - Wood fuel values. p. 18-20. - Harvesting wood in stick form, by Fred C. Simmons. p. 21-33. - Discussion. p. 33-34. Source and availability of chipped wood for fuel, by Ronald R. Alexander. p. 35-38. - Use of chips in gravity feed stoves, by John W. Allen. p. 39-49. - Discussion. p. 49-51. - Spreader stoker firing of wood and coal in multiple fuel furnaces, by Earle C. Miller and George E. Hanson. p. 53-71. - Discussion p. 71-72. - Briquets from sawdust, bark and other waste, by Walter W. Letts. p. 73-76. - Discussion. p. 76-77.

INSTRUMENTS

AIR SPEED AND FUEL FLOW MEASUREMENT. FINAL REPORT. CONTRACT W33-038-AC-15817. Lehigh University. Dept. of Mechanical Engineering, Bethlehem, Pa. May 1949. 13f Mi $1.75, Enl Pr $3.75. PB 104208

A summary is presented of progress reports on the design, construction, and tests of a pitot-static tube or similar primary element applied to the measurement of the speed of airplanes at supersonic velocities. Four pressure combinations were selected as the most promising for use in flight Mach number measurement. Two of these combinations are believed most suitable for application to aircraft; the pitot-static and pitot-cone systems. Both should be subjected to additional testing and evaluated. Some frames will not reproduce well. For 6th and 9th reports see PB 104209-104210.

AIR SPEED AND FUEL FLOW MEASUREMENTS. PROGRESS REPORT NO. 6, CONTRACT NO. W33-038-AC-15817, by B. K. Erdoss. Lehigh University, Institute of Research. Nov 1947. 2f Mi $1.25, Enl Pr $1.50. PB 104209

1. Air speed indicators 2. Pitot tubes 3. Fuels, Aviation - Flow.

For 9th report see PB 104210, for final report see PB 104208.

AIR SPEED AND FUEL FLOW MEASUREMENT. REPORT NO. 9, CONTRACT NO. W33-038-AC-15817. Lehigh University. Dept. of Mechanical Engineering, Bethlehem, Pa. Jan 1949. 87f graphs, tables Mi $3.75, Enl Pr $12.50. PB 104210

1. Air speed indicators 2. Fuels, Aviation - Flow 3. Pressure, Air - Probes - Tests 4. Meters, Mach 5. Shock waves - Pressure - Airplanes.

For 6th report see PB 104209, for Final report see PB 104208. Accompanied by appendices: A. Test of experimental pressure probe no. 1 at Mach number 2.00 by R. C. Huyett. - B. Test of experimental pressure probe no. 1 in a subsonic jet, by D. S. Johnson. - C. Corrections applied to Progress report no. 8, by D. S. Johnson. D. Aproximate equation of the detached shock in front of a hemisphere and attached cylinder, by D. S. Johnson and W. O. Munz.

DESIGN CHARACTERISTICS OF THE VORTEX-TUBE SAND TRAP, by George L. Koonsman and Maurice L. Albertson. Colorado. Agricultural and Mechanical College, Fort Collins, Colo. n.d. 8p diagr, graphs Available from Civil Engineering Dept., Colorado A & M College, Fort Collins, Colo. PB 104253

1. Tubes, Vortex - Design 2. Sediment - Deposition.

DEVELOPMENT OF RUGGEDIZED ELECTRICAL MEASURING INSTRUMENTS (METERS) FINAL REPORT ON CONTRACT NO. W36-039-sc-33668, MAY 12, 1947 TO JAN 1950, by R. A. Ammon and Arthur R. Tice. Marion Electrical Instrument Co., Manchester, N. H. Jan 1950. 76p photos, fold drawings, diagrs, graphs, table Mi $3.50, Ph $10.00. PB 104069

1. Meters, Electric 2. SIG Contract W36-039-sc-33668. Final report.

ELECTRONIC POLYNEUMOGRAPH. ELECTRONIC RECORDING OF TIDAL INSTANTANEOUS FLOW, RESPIRATORY RATE, AND MINUTE VOLUME WITH A GAS SAMPLING DEVICE FOR OXYGEN AND CARBON DIOXIDE ANALYSIS IN EXPIRED AIR, by A. C. Young, L. D. Carlson, W. F. Quinton, H. L. Burns. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1951. 20p photo, diagrs, graphs, tables Mi $1.75, Ph $2.50.
PB 104115

One phase of the instrumentation for field studies on acclimatization is described. The report indicates the use which may be made of this phase directed toward determination of respiratory minute volumes and analysis of expired air. This report is one of three to be presented by the University of Washington, Seattle, Wash. under USAF Contract no. AF33 (038)-422 on work conducted at Ladd Field, Alaska, during the winter 1949-1950. See also PB 104116. AAF TR 6243.

MEASUREMENTS OF MECHANICAL SHOCK BY PEAK-READING INSTRUMENTS, by Irwin Vigness. U. S. Naval Research Laboratory. May 1951. 19p diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 104312

Consideration has been given primarily to general types of peak-reading instruments used for measurements of mechanical shock which include: (a) the contact-break and contact-make type gage, in which a spring-loaded mass is held against a seating until inertial forces caused by an acceleration are sufficient to break the contact; (b) the reed gage; (c) the crusher gage; (d) the indenter gage; and (e) the fracture gage. Principal attention has been given to the fist type. Curves are given showing the response of these instruments to some simple types of shock motion. These include such factors as (a) the maximum relative motions of the inertial mass and the gage body and (b) the time the contact is open. A concept of a maximum frequency response applicable to most of these gages is introduced. It gives an upper frequency limit for which they indicate maximum acceleration amplitudes within acceptable limits of accuracy. NRL R 3818.

RADAR SIGNAL SPECTROGRAPH (RASAPH). DESCRIPTION OF THE INSTRUMENT AND ITS CIRCUITRY, by Edwin L. Williams, Jr. Massachusetts Institute of Technology. Dept. of Meteorology. Jan 1950. 25p photos, diagrs, graphs Mi $2.00, Ph $3.75.
PB 104282

The purpose of the instrument is to present a measurement of the intensity fluctuations of radar echoes which are caused by changes in the reflecting targets. This report concerns itself primarily with a discussion of the basic differences between the Radiation Laboratory and the Weather Radar versions of the instrument; but, complete circuit diagrams are included and a brief description of each circuit. Weather radar research. Technical report no. 9, pt. B under Contract W36-039-sc-32038. Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O.

RECOMMENDED PROGRAMS FOR IMPROVEMENT AND STANDARDIZATION OF COMPUTER TUBES, by Joseph Kelar. Engineering Research Associates, Inc., St. Paul, Minn. Mar 1951. 8p Mi $1.25, Ph $1.25. PB 104084

The electronic computer art in the past has been to a large extent one of building highly specialized machines using electron tubes designed for highly competitive products such as radio and television receivers. It is rapidly becoming apparent that such tubes are not adequate for digital machines in which reliability and long life are extremely important. This report is an attempt to analyze the present situation and to suggest programs both for maintaining a supply of improved tubes for existing equipment and for developing tubes specifically for computer use. Contract NObsr-42001, Task 23-104. PX 29483.

RINGPOTENTIOMETER FÜR FERNÜBERTRAGUNGEN (RING POTENTIOMETER FOR REMOTE CONTROL TRANSMISSION). Askania-Werke A. G., Berlin. Nov 1941. 11f photos, (Text in German) Mi $1.75, Enl Pr $3.75. PB 104119

1. Potentiometers - Germany 2. Micro NAVSHIPS A4676-46.

Bericht no. 1231.

SOME BASIC CHARACTERISTICS OF WIRE STRAIN GAUGES AND BRIDGE CIRCUITS FOR THESE GAUGES, by Gotthard V. A. Gustafsson. Flygtekniska Försöksanstalten (FFA) Stockholm. 1947. 17p diagrs, graph, table Mi $1.75, Ph $2.50. PB 104027

The following problems are dealt with in this paper: (1) Calculation of the strain and temperature sensitivity of a wire cemented to a surface. (2) Investigation of the factors determining the sensitivity of measuring devices using wire strain gauges. (3) Investigation of the relation between strain and change in resistance of wire strain gauges. (4) Investigation of the relation between strain, balance reading and galvanometer deflection in two types of Wheatstone bridge circuits. FFA no. 22.

MACHINERY

AXISYMMETRIC SUPERSONIC FLOW IN ROTATING IMPELLERS, by Arthur W. Goldstein. U. S. National Advisory Committee for Aeronautics. Jun 1951. 36p diagrs, graphs, tables Mi $2.25, Ph $5.00.
PB 104242

General equations are developed for isentropic, frictionless, axisymmetric compressible flow in rotating impellers with blade forces eliminated in favor of the blade-surface function. The characteristic equations for supersonic flow are developed and a computing technique is utilized to find the effect of variations of design parameters on internal flow and work-input distribution. NACA TN 2388.

CONSTRUCTION AND USE OF CHARTS IN DESIGN STUDIES OF GAS TURBINES, by Sumner Alpert and Rose M. Litrenta. U. S. National Advisory Committee for Aeronautics. Jul 1951. 58p diagrs, graphs (1 fold) Mi $2.75, Ph $7.50. PB 104369

A method is presented for the computation and graphic presentation of a series of possible turbine designs for any specific application. The use of a preliminary design chart is suggested to determine the number of stages and the effects of exit whirl and area divergence on possible configurations. A specific design chart can then be made to aid in the study of the effects of diameter and radius ratio on important design parameters such as Mach numbers, turning angles, and stresses. NACA TN 2402.

FRICTION LOSSES IN SELECTED VALVES AND FITTINGS FOR IRRIGATION PUMPING PLANTS, by Carl Rohwer. Colorado. Agricultural Experiment Station, Fort Collins, Colo. May 1950. 36p photos, diagrs, graphs, tables Available from Colorado Agricultural Experiment Station, Colorado A. & M. College, Fort Collins, Colo. PB 104255

1. Valves, Hydraulic - Friction 2. Pumping machinery.

Technical bulletin 41.

DEVICE AND PROCEDURE FOR LOADING TESTS ON PILES, by W. Kjellman and Y. Liljedahl. Royal Swedish Geotechnical Institute, Stockholm. Jan 1951. 34p photos, drawings, tables Mi $2.25, Ph $5.00. PB 104013

1. Pile drivers - Sweden 2. Royal Swedish Geotechnical Institute. Proceedings no. 3.

FUEL INJECTORS FOR DAIMLER-BENZ AERO ENGINES. Bosch, Robert, G.m.b.H., Stuttgart, Ger. n.d. 25f photos, diagrs Mi $2.00, Enl Pr $5.00. PB 104023

1. Injectors, Fuel - Germany 2. Micro NAVSHIPS A794-46 3. Micro RTP T/2581.

GEAR-WHEEL PUMP: DISPLACEMENT-FORCE ANALYSIS, by William H. Rasche. Virginia. Engineering Experiment Station, Blacksburg, Va. Sep 1945. 18p diagrs, tables Available from Virginia Polytechnic Institute, Engineering Experiment Station, Blacksburg, Va. $.15. PB 104058

1. Pumps, Rotary - Displacement-force analysis 2. VEES 61.

Bulletin of the Virginia Polytechnic Institute. Vol. XXXVIII, no. 11, Sep 1945.

PERFORMANCE OF AXIAL-FLOW COMPRESSORS AS AFFECTED BY SINGLE STAGE CHARACTERISTICS, by Seymour M. Bogdonoff. Princeton University. Aeronautical Engineering Laboratory, Princeton, N. J. Oct 1949. 35p diagr, graphs Mi $2.25, Enl Pr $6.25. PB 104194

The effect of single-stage characteristics on the over-all performance of multi-stage axial flow compressors is investigated. The single-stage variables studied are the blade loading or pressure rise per stage and the efficiency variation with mass flow. The over-all multi-stage performance is examined, particularly relative to the range of operation with good efficiency and the stalling characteristics. For the investigation, three compressors were designed with 6, 8, and 13 stages to develop a pressure ratio of about 3.2, all handling the same mass flow. A simplified analysis was made, based on experimental cascade and single-stage studies. It resulted that the compressor with the fewest stages has the widest range and the flattest pressure ratio and efficiency variation with mass flow, because the percentage change in developed pressure ratio or axial velocity is smallest for highly loaded blades. PU AEL R155.

PRELIMINARY INVESTIGATION OF WEAR AND FRICTION PROPERTIES UNDER SLIDING CONDITIONS OF MATERIALS SUITABLE FOR CAGES OF ROLLING-CONTACT BEARINGS, by Robert L. Johnson, Max A. Swikert and Edmond E. Bisson. U.S. National Advisory Committee for Aeronautics. Jun 1951. 27p photos, diagrs, graphs, table Mi $2.00, Ph $3.75. PB 104108

The wear and the friction of brass, bronze, beryllium copper, monel, Nichrome V, 24S-T aluminum, nodular iron, and gray cast iron sliding against hardened SAE 52100 steel were studied. NACA TN 2384.

REPORT ON NUTS, SELF-LOCKING-ESNA EB SERIES, HIGH TENSILE EXTERNAL WRENCHING, ELASTIC STOP NUT CORP., UNION, N. J. PART II, by J. A. Flowers. U. S. Naval Air Material Center. Aeronautical Materials Laboratory, Philadelphia, Pa. Jan 1949. 18p photo, tables Mi $1.75, Ph $2.50. PB 104456

Torque, vibration, tensile strength, corrosion resistance, and weather tests were performed on one-piece, self-locking, external wrenching nuts having a washer shape base and a nylon locking device. The aim was to determine the suitability of the nuts for use on naval aircraft in accordance with the minimum requirements of Army-Navy aeronautical Spec AN-N-5a. In addition, tests were made to determine, if there is a deterioration of the locking element because of extreme weather conditions. During the weather test, in which nuts were subjected to -67°F, only two of the 1/2-20 size failed caused by the nylon locking device pulling out of the nut after 15 applications. On the other hand, the nylon insert will not withstand a temperature of 175°F, and it is recommended that the nuts be approved for use on naval aircraft, provided they are not subjected to temperatures greater than 150°F. NAM AML 626012, Part II.

SURFACE PLATES; USE, CARE AND MAINTENANCE OF. U. S. Bureau of Ships. Jan 1951. 8p photos, diagrs, drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 103645

1. Plates, Surface - Maintenance and repair 2. Tools, Machine - Tolerance 3. NAVSHIPS IN 111.

MEDICAL RESEARCH AND PRACTICE

CONSPICUITY OF FLASHING AND STEADY LIGHT SIGNALS. I: VARIATION OF CONTRAST, by Siegfried J. Gerathewohl. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1951. 9p photos, graph, tables Mi $1.25, Ph $1.25. PB 104301

A question of some importance in the design of visual warning devices concerns the type of light stimuli used. In order to investigate the conspicuity of steady light stimuli and intermittent light stimuli, which are frequently employed for this purpose, a series of four experiments was conducted with constant and flashing light signals at contrast ratios of 100, 74, 52, and 33 percent. In these experiments, the response time to the two types of light was considered a measure of their conspicuity. The results obtained demon strate (1) that the conspicuity of the signals is a function of contrast, (2) that-when a multiple complex reaction test must be performed by the observer-flashing light signals are more conspicuous than steady light signals at medium levels of brightness contrast. The applicability of these findings to the construction of warning devices and in radar research is briefly discussed. Special report. AAF SAM Project: Special report.

NEUROHISTOLOGICAL INVESTIGATIONS ON GENERAL OXYGEN DEFICIENCY OF THE BRAIN. I: THE MORPHOLOGICAL BEHAVIOR OF THE GANGLION CELLS AFTER GENERALIZED ACUTE AND SUBACUTE HYPOXIA, by Richard Lindenberg. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Feb 1951. 22p photos Mi $2.00, Ph $3.75. PB 104302

This study shows that the duration of hypoxia preceding death affects the postmortem morphological behavior of ganglion cells. In instantaneous death the ganglion cells exhibited homogenization with and without shrinkage, vacuolization, and "incrustations of the Golgi apparatus." When the brain was kept at body temperature "simple swelling" appeared in 30 minutes, followed by homogenization and vacuolization in 6 hours. If death was preceded by severe hypoxia lasting 10-15 minutes, vacuolization seldom occurred and homogenization was incomplete; 30 minutes of hypoxia produced immediate postmortem pyknomorphia and shrinkage; after hypoxia of 60 minutes, the cells showed no noticeable changes between death and fixation, but the structure was that of cells which had been in a severe hypoxic state for 60 minutes. AAF SAM Project 21-23-004, Report no. 1.

NEUROHISTOLOGICAL INVESTIGATIONS ON GENERAL OXYGEN DEFICIENCY OF THE BRAIN. II: BEHAVIOR OF ASTROCYTES AFTER ACUTE AND SUBACUTE DEATH, by Richard Lindenberg. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Mar 1951. 11p photos Mi $1.75, Ph $2.50. PB 104303

This study showed that in all cases of acute death, with fixation of the brain 8-46 hours after death, clasmatodendrosis of the astrocytes occurred. If severe hypoxia of less than 30 minutes' duration preceded death, clasmatodendrosis was accompanied by acute swelling, which did not occur if the hypoxic phase lasted 30-60 minutes. In cases of subacute death preceded by hypoxia lasting longer than 60 minutes, the astrocytes revealed size variation and curling of the dendrites. Clasmatodendrosis was absent even 48 hours after death. Cell changes after acute death are principally those following fresh, local disturbance of the circulation by an embolism. AAF SAM Project.21-23-004, Report no. 2.

PRODUCTION OF HISTAMINE IN THE BODY DURING HYPOXIA: BLOOD HISTAMINE AND ACUTE HYPOXIA, by William L. Burkhardt, Don Flickinger, Charles R. Coulson, Dominic Criscuolo, Harry F. Adler. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Apr 1951. 7p diagr, graphs Mi $1.25, Ph $1.25. PB 104298

The effect of acute hypoxia on the blood histamine titre was studied to determine if there was a correlation with acute altitude sickness. No increase in blood histamine was found in dogs, cats and humans subjected to acute hypoxia for periods of one and one-half hours. Increased respiratory minute volume in one group did not significantly change the subjects' blood histamine titre as compared with a controlled respiratory group when both were subjected to acute hypoxia. A new biological assay apparatus is described, consisting of a water bath, histamine cup and standardized solution pipettes, muscle holder and recorder. It permits an operator to perform 30-40 assays in a few hours. AAF SAM Project 21-23-015, Report no. 1.

THEORY OF THE PROPAGATION OF MECHANICAL VIBRATIONS IN HUMAN AND ANIMAL TISSUE, by Hans Oestreicher. U. S. Air Materiel Command. Engineering Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Nov 1950. 20p graphs Mi $1.75, Ph $2.50. PB 104014

A theoretical analysis has been made of the behavior of mechanical vibrations in human tissue in a frequency range from 0 to 500,000 cps. For this purpose the human tissue is considered as a continous, viscous, elastic, compressible medium, which can be described by four elastic constants. The basic theory of wave propagation in this medium is developed and applied to two problems: 1) The energy propagation and attenuation in plane compressional waves with particular consideration of the consequences of the high viscosity of human tissue. 2) The field generated by a spherical radiator. It is shown that the energy is propagated in two different kinds of waves: transverse waves, due to the shear elasticity and viscosity, and compressional (acoustical) waves due to the volume compressibility of the medium. A numerical discussion of the relative intensities of these two wave-forms as a function of the frequency, the impedance of the radiator and other questions of energy propagation and absorption is given for human tissue. Although this report is primarily concerned with human muscle tissue, it is pointed out, that the basic equations can also be applied to brain tissue and, for sufficiently high frequencies, to bones and inorganic elastic media. AAF TR 6244.

METALS AND METAL PRODUCTS

INVESTIGATION OF SOFT SOLDERED JOINTS: BIMONTHLY PROGRESS REPORT, by Robert M. Evans, A. F. Haskins, Webster Hodge and B. W. Gonser. Battelle Memorial Institute, Columbus, Ohio May 1950. 11p fold graphs Mi $1.75, Ph $2.50. PB 104147

Progress is reported in the investigation of soft soldered joints; stress rupture tests at 120°C have been completed. Results show that the four solders have the same relative position with respect to this test as they did at room temperature. The weight required to break the joints in 100 min was lowered an average of about 375 lb. The 95 Sn-Sb solder has proved stronger in both room-temperature and elevated-temperature stress-rupture tests. Low temperature stress-rupture tests at -65°C are in progress. Fatigue tests on ring and plug brass-to-brass joints with four solders at three different temperatures were completed. At -65°C the 95 Sn-5Sb solder appeared to be the best, while at room temperature the 70 Sn-30 Pb solder specimens gave the best results. Contract no. AF33 (038)-2396. For bimonthly progress report, Mar 1950 see PB 104146.

INVESTIGATION OF SOFT SOLDERED JOINTS: BIMONTHLY PROGRESS REPORT, by Robert M. Evans, A. F. Haskins, Webster Hodge and B. W. Gonser, to Air Materiel Command, Wright-Patterson Air Force Base. Battelle Memorial Institute, Columbus, Ohio. Mar 1950. 14p fold graphs, tables Mi $1.75, Ph $2.50. PB 104146

Progress is reported on a study of soft soldered

joints. During the period reported, tensile tests on nonaged specimens were completed. It was found that tin-lead solders with higher Sn content are stronger at all temperatures. The Sn-Sb solder was less affected by temperature. Graphs are shown which depict the completed work on stress rupture of the soldered joints at room temperature. Sn-Pb solders have the same relative rating in stress rupture as in normal tensions. The Sn-Sb solder is somewhat stronger in stress rupture than would be expected from the normal tension tests. Fatigue test data for most of the solders are presented. Fungus-growth, humidity-room, and other aging and exposure tests are continuing. Contract no. AF33 (038)-3296. For bimonthly progress report, May 1950 see PB 104147.

INVESTIGATION OF SOFT SOLDERED JOINTS. FINAL REPORT ON CONTRACT NO. AF33(038)-3296, by Robert M. Evans, A. F. Haskins, Webster Hodge, and B. W. Gonser. Battelle Memorial Institute, Columbus, Ohio. Sep 1950. 45p photos, diagrs, graphs (part fold), tables Mi $2.50, Ph $6.25.
PB 104103

An investigation is described to determine the effects of temperature, aging, vibrations, fungus growth and other variables on the strength of soft soldered joints in brass. Four solders, 70Sn-30Pb, 50Sn-50Pb, 20Sn-80Pb, and 95Sn-5Sb, were carried throug out the investigation. Two additional solders, 35Sn-65Pb and 97.5Pb-2.5Ag, were also tested for impact resistance. BMI G1365.

REFRACTORY OXIDE BODIES AND COATINGS FOR AIRCRAFT POWER PLANTS. REPORT NO. 2; REFRACTORY COATINGS (FIRST QUARTERLY REPORT), by J. S. Griffith, John M. Neff, and E. P. Flint. Armour Research Foundation, Chicago, Ill. May 1949. 6p Mi $1.25, Ph $1.25. PB 104350

1. Metals - Coatings, Refractory 2. Coatings, Calcium aluminate 3. Coatings, Strontium aluminate 4. Coatings, Barium titanate 5. ARF Project 90-695G, Report no. 2.

Project no. 90-695G. MX-1035. Contract no. AF33(038)-2289.

REFRACTORY OXIDE BODIES AND COATINGS FOR AIRCRAFT POWER PLANTS. REPORT NO. 1: REFRACTORY OXIDE BODIES (FIRST QUARTERLY REPORT), by John M. Neff, J. S. Griffith, and E. P. Flint. Armour Research Foundation, Chicago, Ill. May 1949. PB 104349

1, Oxides, Refractory 2. Metals - Coatings, Refractory 3. Furnaces, High temperature - Design 4. Resistors, Thorium oxide 5. ARF Project 90-695G, Report no. 1.

Project no. 90-695-G. MX-1035. Contract no. AF33(038)-2289.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS. REPORT NO. 2 UNDER CONTRACT NO. AF33(038)-8517, JAN 16-MAR 15, 1950, by W. R. Johnson, Ben Karnisky, M. Hansen. Armour Research Foundation, Chicago, Ill. Mar 1950. 47p photos, Mi $2.50, Ph $6.25. PB 104435

1. Silicon - Research 2. Silicon alloys 3. Molecular structures 4. ARF Project 90-774B, Report no. 2.

TITANIUM PHASE DIAGRAMS. CONTRACT NO. AF-33(038)-8708, REPORT NO. 7: PHASE DIAGRAMS OF THE TITANIUM-ALUMINUM, TITANIUM-CHROMIUM-IRON, AND TITANIUM-OXYGEN ALLOY SYSTEMS, NOV 15, 1950-JAN 15, 1951, by Harold D. Kessler, M. Hansen, and R. A. Lubker. Armour Research Foundation, Chicago, Ill. Feb 1951. 29p drawing, diagrs, graphs Mi $2.00, Ph $3.75.
PB 104433

1. Phase diagrams 2. Alloys, Binary - Equilibrium diagrams 3. Titanium-aluminum alloys 4. Titanium-chromium-iron alloys 5. Titanium-oxygen alloys 6. ARF Project 90-773B, Report no. 7.

Report no. 1 on extension of Contract AF-33 (038)-8708.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS. BIMONTHLY REPORT NO. 6 UNDER CONTRACT NO. AF33(038)-8517, SEP 16-NOV 15, 1950, by M. Hansen and R. A. Lubker. Armour Research Foundation, Chicago, Ill. Nov 1950. 61p photos, graph, tables Mi $3.00, Ph $8.75.
PB 104439

1. Silicon - Research 2. Silicon - X-ray tests 3. Silicon alloys - Structure 4. Silicon-chromium alloys 5. Silicon-columbium alloys 6. Silicon-iron alloys 7. Silicon-manganese alloys 8. Silicon-molybdenum alloys 9. Silicon-nickel alloys 10. Silicon-tantalum alloys 11. Silicon-tungsten alloys 12. Silicon-vanadium alloys 13. Silicon-zirconium alloys 14. ARF Project 90-774B, Report no. 6.

RESEARCH AND DEVELOPMENT ON THE PHASE DIAGRAMS OF THE TI-MO, TI-CB, AND TI-SI ALLOY SYSTEMS. CONTRACT NO. AF33(038)-8708, REPORT NO. 1, NOV 8 TO DEC 31, 1949, by R. L. Ashbrook, H. Hansen, H. D. Kessler. Armour Research Foundation, Chicago, Ill. Jan 1950. 37p photos diagr, graphs Mi $2.25, Ph $5.00. PB 104434

1. Phase diagrams 2. Alloys, Binary - Equilibrium diagrams 3. Titanium-silicon alloys 4. Titanium-columbium alloys 5. Titanium-molybdenum alloys 6. ARF Project 90-773B, Report no. 1.

KALTPHOSPHATIERUNGSVERFAHREN DER FIRMA LANGBEIN-PFANHAUSER-WERKE A. G., LEIPZIG (COLD PHOSPHATIZING METHOD USED BY THE FIRM LANGBEIN-PFANHAUSER OF LEIPZIG), by Dr. R. Krause. Metallgesellschaft A. G., Frankfort, Ger. Apr 1943. 17f tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 79180s3

1. Phosphatizing, Cold - Germany 2. Langbein-Pfanhauser Werke A. G., Leipzig, Ger. 3. BIOS FR 1298 LD 4. Micro BIOS HEC 12323 5. Micro BIOS FD 292/48, Frames 232-248.

Abstract available as PB 79180s4. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 1298, p. 76 as R 1961.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS. BIMONTHLY REPORT NO. 4 UNDER CONTRACT NO. AF 33 (038)-8517, MAY 16-JULY 15, 1950, by W. R. Johnson, W. Wilson, M. Hansen. Armour Research Foundation, Chicago, Ill. Jul 1950. 43p photos, graphs Mi $2.50, Ph $6.25. PB 104437

1. Silicon - Research 2. Silicon alloys 3. Silicon - Bibliography 4. ARF Project 90-774B, Report no. 4.

FUNDAMENTAL AGING EFFECTS INFLUENCING HIGH-TEMPERATURE PROPERTIES OF SOLUTION-TREATED INCONEL X, by D. N. Frey, J. W. Freeman and A. E. White. U. S. National Advisory Committee for Aeronautics. Jun 1951. 56p photos, diagrs, graphs, tables Mi $2.75, Ph $7.50. PB 104109

Studies were made of the mechanisms by which various aging treatments influenced the mechanical properties of solution-treated Inconel X alloy. Microstructure analyses at the various aged conditions were made by means of X-ray diffraction studies and optical- and electron-micrographic examinations. Correlations of the mechanical properties with the structural analyses and comparisons with the previously determined aging effects on low-carbon N-155 alloy are presented. NACA TN 2384.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS. BIMONTHLY REPORT NO. 5 UNDER CONTRACT NO. AF33(038)-8517, JULY 16-SEP 15, 1950, by William R. Johnson and M. Hansen. Armour Research Foundation, Chicago, Ill. Sep 1950. 37p photos, diagrs Mi $2.25, Ph $5.00. PB 104438

1. Silicon - Research 2. Silicon-chromium alloys 3. Silicon-cobalt alloys 4. Silicon-manganese alloys 5. Silicon-molybdenum alloys 6. Silicon-nickel alloys 7. Silicon-vanadium alloys 8. ARF Project 90-774B, Report no. 5.

STUDY FOR DEVELOPMENT OF NEW STABILIZED HIGH STRENGTH ALUMINUM ALLOYS. FINAL REPORT FROM JULY 1, 1947 TO JUNE 30, 1948 AND DEC 1, 1948 TO JUNE 3, 1949 UNDER CONTRACT NOA(S)8861, by E. H. Kinelski. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Jun 1949. 67p photos, graphs, tables Mi $3.00, Ph $8.75. PB 104379

1. Aluminum alloys - Research 2. Aluminum alloys, Corrosion resisting 3. Aluminum alloys - Microstructure 4. 24S (Aluminum alloy) 5. CAL KA-496-M-4.

COMPILATION OF DATA ON SOFT MAGNETIC MATERIALS, by E.L.R. Webb. National Research Council of Canada. Radio and Electrical Engineering Division. Mar 1951. 10p tables, graphs Available from National Research Council of Canada, Ottawa, Canada, $.10. PB 103801

1. Alloys, Magnetic - Properties - Canada 2. Alloys, Magnetic - Soft - Properties - Canada 3. NRCC ERB-255 4. NRCC 2360.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS. BIMONTHLY REPORT NO. 3 UNDER CONTRACT NO. AF33(038)-8517, MAR 16-MAY 15, 1950, by W. R. Johnson, William Wilson, and M. Hansen. Armour Research Foundation, Chicago, Ill. May 1950. 43p photos Mi $2.50, Ph $6.25. PB 104436

1. Silicon - Research 2. Silicon alloys 3. Silicon - Bibliography 4. ARF Project 90-774B, Report no. 3.

PROGRESS REPORT, CONTRACT NO. W-36-039-SC-32020, FEB-May 1946, by K. Lark-Horovitz. Purdue University. Dept. of Physics, Lafayette, Ind. May 1946. 10p table Mi $1.25, Ph $1.25. PB 104256

1. Conductors, Semi 2. Germanium alloys - Heat treatment 3. Rectifiers, Germanium 4. SIG Contract W36-039-sc-32020.

RESEARCH AND DEVELOPMENT ON TITANIUM ALLOYS. FIRST PROGRESS REPORT COVERING THE PERIOD MAY 18 TO SEP 18, 1949, ON CONTRACT NO. 33(038)-3736, TO WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO. Battelle Memorial Institute, Columbus, Ohio. Aug 1949. 62p diagrs, graphs, tables Mi $3.00, Ph $8.75. PB 104429

Progress is reported in the development of titanium alloys. During the period reported, titanium binary alloys of germanium and nickel were studied, as well as titanium-molybdenum and titanium-manganese ternary alloys. Carbon, copper, chromium, manganese, iron, and cobalt were added to the titanium-molybdenum binary alloys, and nitrogen, copper, molybdenum and cobalt were added to titanium-manganese alloys. The alloys were tested in both the as-hot-rolled temper and after aging the hot-rolled sheet four hours at 750°F. Tensile strengths and elongations for various alloys are listed. Some of the alloys were tested after solution heat treatment at 1600°F. Tests were also completed on "hot pressed" crucibles of tungsten carbide, titanium carbide, and zirconium carbide as refractories for melting titanium. Melts were made in graphic crucibles lines with tantalum carbide and tungsten boride. Photos described in test are not included. Contents: Summary-arc melting titanium-base alloys, by O. W. Simmons and C. T. Greenidge. - Evaluation of experimental titanium-base alloys, by C. M. Craighead, F. Fawn and L. W. Eastwood. - Investigation of refractories for melting titanium by P. J. Maddex and L. W. Eastwood. - Analytical methods for titanium-base alloys: The determination of oxygen in titanium by the Cl_2-CCl_4 method, by E. J. Center and A. C. Eckert. - Analysis of titanium for oxygen by vacuum-fusion methods, by M. W. Mallett, D. G. Thomas and C. B. Griffith.

SOME PRELIMINARY INFORMATION ON BUCKLING AND ULTIMATE STRENGTH OF UNSTIFFENED COMPRESSION SKIN OBTAINED THROUGH BENDING AND COMPRESSION TESTS ON RECTANGULAR CROSS SECTION ALUMINUM TUBES, by Roger A. Anderson. Flygtekniska Försöksanstalten (FFA) Stockholm. 1949. 25p photos, diagrs, graphs, tables Mi $2.00, Ph $3.75. PB 104032

The preliminary experimental program described in the present paper was carried out in order to obtain some information on the accuracy with which buckling of an unstiffened compression skin may be calculated when stresses are above the material elastic limit. and also to determine what load carrying capacity remains after buckling. The tests were carried out with seven rectangular cross-section extruded aluminum tubes subjected to pure bending, and undamaged sections of the same tubes were tested as columns of appropriate length which failed by local plate instability. FFA no. 27.

PROPERTIES OF MAGNESIUM ALLOYS FABRICATED FROM ATOMIZED POWDER. FINAL REPORT ON CONTRACT NO. W33-038-AC-19884 (19479), PT. II SEC. A-D AND APPENDICES. Dow Chemical Co., Midland, Mich. Nov 1949. 445p photos, graph, tables Mi $9.00, Ph $56.25. PB 104431

Magnesium alloys fabricated from atomized powder were investigated. An extrusion survey revealed that magnesium and magnesium alloy powder can be extruded directly without precompacting the pow-

der. The use of atomized powder results in extrusions of many alloys having markedly higher strengths than can be developed by extrusion of billets of the same compositions. Combinations of elements which cannot be attained in magnesium by conventional melting and casting processes are feasible by means of powder extrusion techniques. Many such combinations have been found to land to either exceptionally high strengths, improved fabrication characteristics, improved stress-corrosion resistance, or all three simultaneously. Alloys can also be designed by powder extrusion to have much higher strengths than presently accepted values, and to retain these strengths after heat treatment at temperatures as high as 800°F. Report no. 14770.

STUDY OF SOME FACTORS AFFECTING THE FATIGUE LIFE OF AIRCRAFT PARTS WITH APPLICATION TO STRUCTURAL ELEMENTS OF 24S-T AND 75S-T ALUMINUM ALLOYS, by Bo K.O. Lundberg and Gunnar G. E. Wallgren. Flygtekniska Försöksanstalten (FFA) Stockholm. 1949. 33p drawings, graphs Mi $2.25, Ph $5.00. PB 104035

An investigation of various factors affecting the fatigue life of aircraft parts has been made with the particular objective of studying and comparing the fatigue properties of 24S-T aluminum alloys. This report deals with three types of repeated loadings: gust loads, maneuvering loads for a fighter plane, and pressure cabin loads. FFA no. 30.

MANUFACTURE OF METAL-CERAMIC COMBINATIONS, by Ralph O. Grubel and Lee S. Busch. U. S. Air Materiel Command. Engineering Division. Materials Laboratory, Wright Patterson Air Force Base, Dayton, Ohio. May 1950. 12p Mi $1.75, Ph $2.50. PB 104166

The research in the field of metal-ceramic combinations was successful in producing a non-porous body in which the metal and ceramic were intimately united in a well dispersed, heterogeneous mixture. In the most successful combination, which employs molybdenum and 5 CaO.3 Al_2O_3, there has been nothing to indicate the presence of a chemical bond between metal and ceramic. However, the configuration of the mating surfaces and the absence of any void between them make the mechanical bond excellent. This body was made by impregnating the molten ceramic into a porous base of the high melting point metal. The method of combining metals and ceramics by uniting their powders was also investigated. This phase of the program was dropped in favor of the impregnation technique because the latter produced materials of superior strength and thermal shock resistance. E. F. Swazy appears as author on the title page. Report prepared by P. R. Mallory and Company, Inc. Indianapolis, Indiana, Metallurgical Research Department, under Contract no. W33-038-ac-19697, Item 2. AAF TR 5947.

SINTERMAGNETE AUS EISEN-NICKEL-ALUMINIUM (IRON-NICKEL-ALUMINUM MAGNETS MADE BY THE SINTERING PROCESS), by Guenther Ritzau. Siemens & Halske A. G., Berlin. 1940. 8f photos, graphs, (Text in German) Mi $1.25, Enl Pr $2.50. PB 104175

1. Magnets, Sintered - Germany 2. Magnets, Iron-nickel-aluminum - Germany 3. Iron-nickel-aluminum alloys - Sintering - Germany 4. Micro BIOS/DOCS/1779/715/53 5. Micro BIOS FD 928/49, Frames 1-8

Abstract available as PB 104175s. 1p. Mi $1.25, Ph $1.25. Reprinted from Wissenschaftliche veröffentlichungen aus den Siemens Werken, Werkstoff sonderheft, 1940.

UTMATTNINGSEGENSKAPERNA HOS ETT CR-LEGERATT KONSTRUKTIONSSTAL VID PULSERANDE DRAGBELASTING (FATIGUE QUALITIES OF A CHROMIUM ALLOY STEEL FOR PULSATING TENSILE STRESSES), by S. Luthander and G. Wallgren. Flygtekniska Försöksanstalten (FFA) Stockholm. 1945. 24p graphs, tables (Text in Swedish and English) Mi $2.00, Ph $3.75. PB 104025

1. Steel, Chromium - Fatigue tests - Sweden 2. Steel, Chromium - Tensile tests - Sweden 3. FFA no. 13.

Summary and translation of text of figures in English.

METEORALOGY AND CLIMATOLOGY

HUMIDITY MEASUREMENT RESEARCH. FINAL REPORT ON CONTRACT NO. W-36-039-SC-32045, by Katherine B. Blodgett. General Electric Co., Research Laboratory, Schenectady, N. Y. Aug 1948. 12p diagrs, tables Mi $1.75, Ph $2.50. PB 104068

1. Humidity - Measurements 2. SIG Contract W-36-039-sc-32045, Final report.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 13, JUL 1-OCT 1, 1950, EIGHTH QUARTERLY PROGRESS REPORT ISSUED UNDER CONTRACT NO. W-36-039-SC-38141, PREPARED by Vincent J. Schaefer. General Electric Co., Schenectady, N. Y. Research Laboratory. Oct 1950. 8p Mi $1.25, Ph $1.25. PB 103976

1. Rain, Simulated 2. Clouds - Formation. 3. SIG Contract W36-039-sc-38141, Report no. 8 4. GE RL 454.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 14, OCT 1, 1950-JAN 1, 1951, PREPARED by Vincent J. Schaefer and Bernard Vonnegut. General Electric Co., Schenectady, N. Y. Research Laboratory. Jan 1951. 8p Mi $1.25, Ph $1.25. PB 103977

1. Rain, Simulated 2. Clouds - Formation 3. SIG Contract W-36-039-sc-38141, Report no. 9 4. GE RL 495.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B. Ninth quarterly progress report issued under contract no. W-36-039-sc-38141,

PROJECT CIRRUS, QUARTERLY PROGRESS REPORT NO. 15, PREPARED by Vincent J. Schaefer and Bernard Vonnegut. General Electric Co. Research Laboratory, Schenectady, N. Y. Apr 1951. 6p Mi $1.25, Ph $1.25. PB 104295

1. Silver iodide 2. Rain, Simulated 3. Clouds - Formation 4. SIG Contract W36-039-sc-38141 Quarterly report no. 10 5. GE RL 537.

Tenth quarterly report issued under Contract no. W-36-039-sc-38141.

STÖRSTRAHLUNG DER ATMOSPHÄRE (ATMOSPHERIC DISTURBANCES CAUSING INTERFERENCE) Danzig. Technische Hochschule. Elektrotechnisches

Institut. Feb 1944. 11f diagrs, graphs (Text in German) Mi $1.75, Enl Pr $3.75. PB 104017

1. Atmosphere - Disturbance - Germany 2. Interference, Electrical - Germany 3. Micro NAVSHIPS E436-46.

HARVARD-MOUNT WASHINGTON ICING RESEARCH REPORT, 1946-1947, by E. E. Howell, Parker Whipple, Ralph W. Burhoe and others. U. S. Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1948. 809f photos, diagrs, graphs, tables Mi $9.00, Enl Pr $106.25. PB 104191

Report by Harvard University with cooperation of Mt. Washington Observatory, Inc., on work done under Contract W33-038-ac-15827. Project engineer: Ralph W. Hawn. Contents: 1. Summary of researches - 2. Icing in relation to air masses and fronts, by Parker Whipple. - 3. Lapse rate in relation to icing, by Wallace E. Howell and Parker Whipple. - 4. Duration of icing at selected intensities on Mt. Washington, by Ralph W. Burhoe. - 5. Icing on Mt. Washington and the synoptic weather situation, by Ralph W. Burhoe. - 6. Icing at Mt. Washington near the tops of cloud layers, by Robert B. Smith. - 7. Preliminary report on the relation of icing to turbulence at Mt. Washington, by W. E. Howell. - 8. Preliminary report on statistical investigation of the Mt. Washington series of icing observations, by Victor Conrad. - 9. Second report on statistical investigations of icing, by Victor Conrad. - 10. Third report on statistical investigations of icing, by Victor Conrad. - 11. Conditions for run-off and blow-off of catch on multicylinder icing meter, by Victor Clark. - 12. On the usefulness of cylinder collection efficiency curves for rare drop size distributions, by Robert B. Smith. - 13. Report on the Harvard-Mt. Washington icingometer, by Wallace E. Howell. - 14. System for the protection of pitot tube pressure lines from ice, by Wallace E. Howell. - 15. Effect of surface treatments on the heat requirements for ice protection of small instruments, by Robert B. Smith. - 16. Development and testing of an instrument for measuring snow content of the air, by Robert B. Smith. - 17. Variations of the wind near the ground on the summit of Mt. Washington and apparatus for measurement, by S. P. Fergusson. - 18. Contribution to the evaluation of the multicylinder icing meter, by Wallace E. Howell. - 19. Effect of the vertical gradients of wind speed and water content on measurements with the multicylinder icing meters, by Walter E. Howell. - 20. Comparative measurements of cloud drop sizes and size distributions by multicylinder and impact methods, by Wallace E. Howell. - 21. Experiments with a ranging chamber for measuring drop size and size distribution by Wallace E. Howell. - 22. Preliminary report on comparative observations of ice accumulation on airfoils, spheres, cones, ribbons, and stationary and rotating cylinders, by Wallace E. Howell. - 23. Is there an altitude above which icing will not occur or will be negligible? by Charles F. Brooks. - 24. Experiments in the nucleation of clouds with dry ice, by Wallace E. Howell. - 25. Occurrence of icing at temperatures near the self-nucleating critical limit (-35°C) by Victor Clark. - 26. Graphs of maximum liquid water content in clouds, by Victor Clark. - 27. Icing nomenclature, by Victor F. Clark. - 28. Experimental investigations in formation of ice and water nuclei at low temperatures. Inferences regarding the growth of atmospheric ice crystals, by Helmut Weichmann. - 29. Comparison of the conditions for the formation of water drops and ice particles by W. Schwerdtfeger. - 30. Routine and cloud data observations. AAF TR 5676.

MINERALS AND MINERAL PRODUCTS

BIBLIOGRAPHY ON RESEARCH RELATED TO DETERMINATION OF THE RESISTANCE OF BITUMINOUS MATERIALS TO DETERIORATION CAUSED BY PHYSICAL AND CHEMICAL CHANGES, PREPARED BY COMMITTEE ON RESISTANCE OF BITUMINOUS MATERIALS TO DETERIORATION CAUSED BY PHYSICAL AND CHEMICAL CHANGES, BITUMINOUS DIVISION, DEPARTMENT OF MATERIALS AND CONSTRUCTION, HIGHWAY RESEARCH BOARD, NATIONAL RESEARCH COUNCIL. Highway Research Board. Committee on Resistance of Bituminous Materials to Deterioration Caused by Physical and Chemical Changes. 1951. 92p Available from Highway Research Board, National Research Council, 2101 Constitution Ave., Washington, D. C. $.75. PB 104073

1. Bituminous materials - Deterioration prevention - Bibliography 2. Roads - Surface treatment - Bituminous materials - Bibliography 3. HRB B 9.

CERAMIC MATERIALS APPLIED TO UNCOOLED ROCKET POWER PLANTS, PREPARED by R. W. McLane. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. May 1948. 6p Mi $1.25, Ph $1.25. PB 104287

The use of ceramic materials in uncooled rocket power plants is discussed. Parts of the engine for which the ceramic materials are being considered are the nozzle section, combustion chamber or the interior surfaces thereof, and guiding devices which project into or impinge upon the jet stream. Ceramic materials are being considered for use in rocket engines used in nonrecoverable missiles, rocket engines used as auxiliary thrust units, and rocket engines used as prime movers in piloted aircraft. Ceramics have advantages arising from the variety of available construction methods, flexibility of certain refractory materials in meeting specific requirements, and ease of construction compared with other materials.

CERAMIC-METAL BODIES FOR USE AS AIRCRAFT POWER PLANT PARTS SUBJECTED TO ELEVATED TEMPERATURES: QUARTERLY REPORT NO. 1, MARCH 1, 1950 - MAY 31, 1950 TO OFFICE OF AIR RESEARCH, WRIGHT-PATTERSON AIR FORCE BASE, DAYTON, OHIO. New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. May 1950. 17p diagr, graphs, tables Mi $1.75, Ph $2.50. PB 104142

Progress accomplished on the studies of ceramic-metal bodies, for use as aircraft power-plant parts, subjected to elevated temperatures is outlined. The fired strengths and oxidation resistance of various compositions in the MgO-TiN-NiO systems were determined. A preliminary investigation was conducted on magnesia-titanium carbide-nickel bonded bodies in order to explore the potentialities of such a system. The interfacial tension between various ceramic materials and molten metals was also studied.

Results are given in tables and graphs. Contract no. W33-038-ac-15800. Contents: - Section I. Determination of fired strengths and oxidation resistance of various compositions in the system MgO-TiN-NiO, by J. W. Londeree, Jr. - Section II. Progress in the preliminary investigation of magnesia-titanium carbide-nickel bonded bodies, by J. W. Mulder. - Section III. Study of interfacial tension between various ceramic materials and molten metals, by Frederick K. Davey. See also PB 104140-PB 104141, PB 104148-PB 104149, PB 104164.

CERAMIC METALLOID-METAL BODIES, by J. H. Koenig, L. D. Hower, Jr. and R. B. Sosman. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1950. 11p diagr, tables Mi $1.75, Ph $2.50. PB 104140

Progress is reported in a fundamental study of metal-ceramic oxide reactions. An approach was made from a "crystal chemistry" point of view in which metalloids and ceramic oxides were chosen on the basis of their physical-chemical properties. Metalloid compounds were investigated as a bonding material to unite chemically the ceramic oxide and metal. Sintered mixtures of titanium nitride and five oxides were studied with x-ray and metallographic microscope. Titanium monoxide is believed to be formed from solid state reaction of MgO and TiN. Nickel metal was chosen on the basis of adherence to MgO-TiN mixtures. Several compositions of the MgO-TiN-NiO system were investigated and their physical properties evaluated. Report 23 prepared by New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. under USAF Contract no. W33-038-ac-15800. See also PB 104141 - PB 104142, PB 104148 - PB 104149, PB 104164. NJCRS 23. AAF TR 6078.

CRYSTAL STRUCTURE OF B-MONOCLINIC SELENIUM, by R. D. Burbank. Massachusetts Institute of Technology. Laboratory for Insulation Research. Apr 1951. 30p photos, diagrs, tables Mi $2.00, Ph $3.75. PB 104336

The crystal structure of β-monoclinic selenium has been determined by the application of the Harker-Kasper phase inequalities and two-dimensional Fourier syntheses. The β-selenium molecule is an eight-membered chain with the configuration of a puckered ring molecule in which one of the bonds has been broken. At one end of the chain the terminal atom and its neighbor are nearly double-bonded. The remaining six bonds in the chain are approximately single bonds. At several points in each molecule there are unusually strong interactions with neighboring molecules. About 7.7 electron pairs are utilized for bonding within the molecule while 0.3 electron pairs are engaged in intermolecular bonding. Diffraction data have been obtained which demonstrate that a single crystal of β-selenium can transform directly into a single crystal of metallic selenium. During the transition the molecules are probably broken down into smaller fragments which recombine to form the infinitely long spiral chains of metallic selenium. Relations between mixed crystals of sulfur and selenium, and between the various polymorphs of selenium are discussed. MIT LIR TR 43.

DEVELOPMENT AND APPLICATION OF BARIUM TITANATE CERAMICS AS NON-LINEAR CIRCUIT ELEMENTS. THIRD QUARTERLY REPORT ON CONTRACT NO. W36-039-SC-44606. Glenco Corp., Metuchem, N. J. May 1950. 17p photos, diagrs, graph Mi $1.75, Ph $2.50. PB 104232

Progress is reported of an investigation on nonlinear dielectrics using ferroelectric barium titanate, and of the development of these dielectrics for use in electronic circuit elements. It was found that titanate ceramics as nonlinear circuit elements are adaptable to circuit design. Two dielectric amplifiers were built around these nonlinear elements; power gain was demonstrated in both instances. Initial studies on frequency response in a dielectric amplifier with an r-f carrier revealed that, with proper design, nonlinear titanates can function in r-f circuits in the megacycle region. It was concluded that these amplifiers can be used as a counting device in computers.

DIRECTIONAL PROPERTIES OF GLASS-FABRIC-BASE PLASTIC LAMINATE PANELS OF SIZES THAT DO NOT BUCKLE, by Fred Werren and C. B. Norris. U. S. Forest Products Laboratory, Madison, Wis. Apr 1949. 50p photos, diagrs, graphs, tables Mi $2.50, Ph $6.25. PB 104449

It has been suggested that glass-fabric laminates might be treated as an orthotropic material and that general elastic equations and interaction formula for plywood might be applied to this material. The elastic and strength properties of glass-fabric laminates, at various angles to the grain, were determined on specimens proportioned to preclude buckling or failure owing to elastic instability. The experimental and theoretical values in tension, compression and shear were compared. Data showing the effect of grain direction upon the bearing, edgewise shear, and interlaminar-shear properties are presented. The correlation between experimental and theoretical values is good, with the exception of panel-shear test values. AAF Order nos. (33-038), 47-359, 47-2902E, 48-11-E. FPL 1803.

DIRECTIONAL PROPERTIES OF GLASS-FABRIC-BASE PLASTIC LAMINATE PANELS OF SIZES THAT DO NOT BUCKLE. SUPPLEMENT, by Fred Werren. U. S. Forest Products Laboratory, Madison, Wis. Apr 1950. 37p graphs, tables Mi $2.25, Ph $5.00. PB 104449s

1. FPL 1803-A.

NAer Order 00793, amendment no. 1, and USAF-PO-33-038 (50-1078-E). Supplement to PB 104449.

FLEXURAL PROPERTIES OF SOME GLASS FABRIC BASE PLASTIC LAMINATES AT ELEVATED TEMPERATURES, by B. M. Axilrod and M. A. Sherman. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Feb 1950. 44p photos, graphs, tables Mi $2.50, Ph $6.25. PB 104447

The flexural ultimate strengths and secant moduli of elasticity of a number of types of glass-fabric, base plastic laminates were determined at temperatures up to 375°C. These included silicone, phenolic, and polyester resins laminated with 181 fabric and melamine resin laminated with 128 fabric. Melamine and phenolic laminates developed the highest strength properties at elevated temperatures up to and including 300°C after 1/2 hour at this temperature. The best polyesters tested retained about one third of their flexural strength at 150°C after

1/2 hour exposure and about 1/2 after 200 hours exposure at this temperature. Silicone laminate was the most resistant to deterioration. AAF TR 5940.

GASVERWENDUNG IN DER GLAS-,PORZELLEN-, UND EMAILLIER-INDUSTRIE (EMPLOYMENT OF GAS IN THE GLASS, PORCELAIN AND ENAMEL INDUSTRIES), by A. Albrecht and Dipl.-Eng. Ortlieb. Deutscher Normenausschuss E. V. Fachkommission Gasverwendung in der Industrie. Dec 1946. 594f photos, drawings, diagrs, tables (Text in German) Mi $9.00, Enl Pr $78.75. PB 103889

1. Gas - Ignition - Germany 2. Gas, Fuel - Germany 3. Enamel and enameling industry - Germany 4. Glassware - Manufacture - Germany 5. Porcelain industry - Germany 6. Micro BIOS FD 2953/48, Frames unnumbered.

Abstract available as PB 103889s. 2p. Mi $1.25, Ph $1.25. Microfilms are numbered 83.01-83.05, 83.07-83.11. Some frames will not reproduce well.

PRODUCTION OF WALL TILES AND DESCRIPTION OF "KERABEDARF" PATENT TUNNEL KILNS. Keramische Industrie-Bedarfs A. G., Berlin. 1946. 130f drawings, graphs (Text in German) Mi $5.00, Enl Pr $17.50. PB 103813

1. Tiles, Glazed - Manufacture - Germany 2. Kilns, Ceramic - Design - Germany 3. Micro BIOS DOCS 2045/3156 4. Micro BIOS FD 5118/47, Frames 1-119.

Abstract available as PB 103813s. 2p. Mi $1.25, Ph $1.25. For further information on this subject see BIOS FR 1187.

PROGRESS REPORT, CONTRACT NO. W36-039-SC-32020, DEC 1, 1946-FEB 28, 1947. Purdue University. Dept. of Physics, Lafayette, Ind. Feb 1947. 76p drawings, diagr, graphs, tables Mi $3.50, Ph $10.00. PB 104257

1. Conductors, Semi 2. Hall effect 3. Tellurium - Electrical properties 4. Germanium - X-ray inspection 5. Rectifiers, Germanium 6. SIG Contract W36-039-sc-32020.

Contents: Pt. I. Semi-conductor problems: A. Low temperature behavior and transition from classical to quantum statistics, by Vivian Johnson and K. Lark-Horovitz. - B. Determination of the Hall effect values and resistivity of tellurium in a high vacuum, by W. W. Scanlon and K. Lark-Horovitz. - C. Dependence of Hall effect values upon magnetic field, by W. W. Scanlon and K. Lark-Horovitz. - D. Preparation of samples for low-temperature measurement, by W. W. Scanlon and K. Lark-Horovitz. - E. X-ray investigation of germanium-tin samples, by Leslie Dowell and K. Lark-Horovitz. - Pt. II. Rectifier and contact barrier problems: A. Time lags in high back voltage characteristics, by S. Benzer. - B. Spreading resistance saturation effects, by R. Bray and R. E. Davis. - C. Proposed calculations of field dependency of spreading resistance, by R. Bray. - D. Response time of photoeffects in Ge, by S. Benzer.

PROGRESS REPORT, CONTRACT NO. W36-039-SC-32020, JUNE 1, 1947-AUG 1, 1947. Purdue University. Dept. of Physics, Lafayette, Ind. Aug 1947. 37p graphs, tables Mi $2.25, Ph $5.00. PB 104258

1. Conductors, Semi 2. Germanium - Electrical properties 3. Tellurium - Spectrographic analysis 4. Germanium - Tin alloys 5. Selenium - Purification 6. SIG Contract W36-039-sc-32020.

Contents: A. Application of resistivity theory to germanium samples at very low temperatures, by V. A. Johnson and K. Lark-Horovitz. - B. Hall curves for tin-doped germanium, by V. A. Johnson. - C. Hall effect of pure tin, by W. W. Scanlon. - D. Preparation of samples for investigations by other research groups, by W. W. Scanlon. - E. Hall effect of 35P(.006% al) by W. W. Scanlon. - F. Spectroscopic analysis of tellurium, by W. W. Scanlon. - G. Determination of dielectric constant and other physical constants of tellurium, by V. A. Johnson. - H. Preliminary work on selenium, by K. Lark-Horovitz and J. W. Thornhill. - I. Miscellaneous.

PROGRESS REPORT, CONTRACT NO. W36-039-SC-32020, AUG 1, 1947-OCT 31, 1947. Purdue University. Dept. of Physics, Lafayette, Ind. Oct 1947. 65p diagrs, graphs Mi $3.00, Ph $8.75. PB 104259

1. Conductors, Semi 2. Germanium - Purification 3. Hall effect 4. Tellurium - Electrical properties 5. Germanium - Conductivity 6. SIG Contract W36-039-sc-32020.

Contents: Pt. I. Semi-conductor problems: 1. Preparation of hyper-pure germanium, by R. M. Whaley and R. E. Davis. - 2. Crystallization of selenium, by K. Lark-Horovitz and J. W. Thornhill. - 3. A. C. methods for measuring the Hall constant, by V. E. Bottom. - 4. Application of theory of resistivity to tellurium, by V. A. Johnson and K. Lark-Horovitz. - 5. Galvanomagnetic and thermo-magnetic effects in tellurium, by Wayne Scanlon and K. Lark-Horovitz. - 6. Determination of the Hall effect in semi-conductors, by W. W. Scanlon. - 7. Preliminary survey of transverse galvanomagnetic and thermomagnetic effects, by V. A. Johnson. - Pt. II. Rectifier and contact barrier problems: 1. Temperature dependency of electric field effects in bulk germanium, by R. Bray. - 2. Photoeffects in rectifying contacts, by S. Benzer.

PROGRESS REPORT, CONTRACT NO. W36-039-SC-32020, FEB 1-Apr 30, 1948. Purdue University. Dept. of Physics, Lafayette, Ind. Apr 1948. 34p graphs Mi $2.25, Ph $5.00. PB 104260

1. Conductors, Semi 2. Hall effect 3. Ettingshausen effect 4. Tellurium - Electrical properties 5. Silicon - Electrical properties 6. Germanium - Electrical properties 7. Crystals - Selenium 8. SIG Contract W36-039-sc-32020.

Contents: 1. Electrical properties of tellurium, by V. E. Bottom. - 2. Properties of intrinsic tellurium, by V. A. Johnson. - 3. Comparison of intrinsic properties of silicon, germanium, and tellurium, by V. A. Johnson. - 4. Ettingshausen effect in semiconductors in the impurity range. - 5. Interpretation of the signs of the transverse effects. - 6. Low temperature resistivity of an N-type germanium sample with low temperature, by V. A. Johnson and Lark-Horovitz. - 7. Application of semi-conductor theory to SiC, by K. Lark-Horovitz and V. A. Johnson. - 8. Growth of selenium single crystals, by K. Lark-Horovitz and J. W. Thornhill. - 9. Miscellaneous.

PROGRESS REPORT NO. 4 COVERING THE PERIOD FROM APRIL 15, 1950 - JULY 15, 1950 ON CONTRACT NO. W-36-039-SC-44484, by F. P. Hall and Robert Morgan. Pass & Seymour, Inc., Syracuse, N. Y. Jul 1950. 13p table Mi $1.75, Ph $2.50. PB 104387

Progress is reported in the commercial development of dense cordierite bodies. Tests conducted on

samples of body G10a (completely vitrified) showed that this body was of an L-3 grade. Subsequent tests at elevated temperatures indicated that the dielectric properties of this body deteriorated much faster with temperature increase than did the conventional steatite bodies. The ball clay was eliminated from G10a, as this was probably the principal source of the alkalies, and a new body G10-3 was developed. Pressed discs made of this body were prepared for testing for dielectric strength and power factor. A summary is added, covering the work done on this problem during the past year. From Pass & Seymour, Inc. Ceramic Laboratory Signal Corps Research Program. SIG Contract W36-039-sc-44484, Report no. 4.

REFRACTORY OXIDE BODIES AND COATINGS FOR AIRCRAFT POWER PLANTS, by D. C. Schnell and John M. Neff. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1950. 14p diagrs, tables Mi $1.75, Ph $2.50. PB 104150

Refractory coatings for jet engine alloys are being developed by means of a novel process involving liquid immiscibility in refractory oxide melts. This method is somewhat analogous to the process used in the manufacture of Vycor high-silica glass. Detailed data on systems containing MgO, B_2O_3 and various refractory oxides are given. Several experiments on lithium-oxide systems containing boric oxide and refractory oxides are described, as are a few tests of aluminate coatings applied to stainless steel. Initiated under Government Contract no. W33-038-ac-16533 (17993) which terminated 30 April, 1948. Work was resumed as part of a research program authorized by USAF Contract no. AF 33(038)-2289. This is report no. 5 under the current contract. AAF TR 6081.

REFRACTORY PROTECTIVE COATINGS FOR METALS, by J. H. Koenig, L. D. Hower, Jr. and R. B. Sosman. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1950. 6p Mi $1.25, Ph $1.25. PB 104149

Progress is reported in the development of magnesia coatings for inconel, and a study was made of a baria-alumina-silica glass coating to be applied to a turbine bucket for testing. Coating 75-2 could be applied smoother and more evenly by dipping than by spraying. The proper dipping consistency was obtained by continued grinding but some difficulty was encountered in control of the thickness because of thixotropy of the slip. Gas bubbles were eliminated from baria-alumina-silica coating by increasing the fritting period. Surface defects appearing from time to time were attributed to the furnace atmosphere. Report 20 prepared by New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. under USAF Contract no. W33-038-ac-15800. Contents: - Section I. Summary of progress in the development of magnesia coatings for inconel for a period from 1 October 1949 to 1 January 1950, by Frederick K. Davey. - Section II. Study of baria-alumina-silica glass coating to be applied to a turbine bucket for testing, by James W. Mulder. See also PB 104140-PB 104142, PB 104148, PB 104164. NJCRS 20. AAF TR 6069.

REFRACTORY PROTECTIVE COATINGS FOR METALS OF AIRCRAFT POWER PLANTS, SUBJECTED TO ELEVATED TEMPERATURES, by J. H. Koenig, L. D. Hower, Jr. and R. D. Sosman. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jul 1950. 14p tables Mi $1.25, Ph $1.25. PB 104148

A summary report is given of investigations made to develop high-temperature resistant coatings for metals used in combustion chambers of jet engines, rotor and stator parts in turbojets and turbosuperchargers, and exhaust gas conduits on all types of aircraft power plants. Three methods of applying crystalline type coatings to the metal were outlined. These methods are vaporization in a high-temperature zone with subsequent condensation on the metal; multilayer techniques involving metal-oxide mixtures bonded by sintering or hot pressing; and spraying magnesia lithium-fluoride mixtures on metal and subsequent bonding to the adherent oxide layer of the metal during firing. Glass-type coatings produced from compositions in the ternary system $BaO-Al_2O_3-SiO_2$ were also investigated. Report 22 prepared by New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. under USAF Contract no. W33-038-ac-15800. Contents: Section I. Crystalline type coatings. Section II. Investigations of glass-type coatings. See also PB 104140-PB 104142, PB 104149, PB 104164. NJCRS 22. AAF TR 6071.

REPORT ON TESTS OF PITTSBURGH PLATE GLASS MODEL C-97 WINDSHIELDS, by W. R. Stewart. Boeing Aircraft Co., Seattle, Washington. Oct 1949. 45p photos, diagrs, graphs Mi $2.50, Ph $6.25. PB 104430

Tests were conducted on eight electrically heated windshields for the C-97 cargo airplane, in a flexible jig constructed to simulate airplane pressure deflections. The test procedure consisted of starting with an outside air temperature of 70° to 85°F; applying voltage, and allowing temperatures and deflections to stabilize at 120°F; applying a pressure of 6.5 psi, lowering the temperature to -50°F, and allowing the temperatures and deflections to stabilize; and returning to 70°F. The procedure was repeated, increasing the pressure by 1 psi until failure of the outer pane. These failures appeared to be the result of relative movement between the edges of the two panes of glass with removal of pressure and at low temperatures. The pressures applied prior to failures varied from 6.5 to 9.5 psi. The inner pane failures, after outer pane failures, occurred at pressures of 23 to 29 psi. Contract no. W33-039-ac-15587. Test no. T-27663.

STUDIES OF HIGH-TEMPERATURE PROTECTION OF A TITANIUM-CARBIDE CERAMAL BY CHROMIUM-TYPE CERAMIC-METAL COATINGS, by Dwight G. Moore, Stanley G. Benner and William N. Harrison. U. S. National Advisory Committee for Aeronautics. Jun 1951. 24p photos, diagrs, tables Mi $2.00, Ph $3.75. PB 104049

Four ceramic-metal coatings of varying frit content were prepared and applied to ceramals containing 80 percent chromium and 20 percent cobalt. Oxidation penetration, transverse breaking load, and thermal shock resistance of the various specimens were determined after prolonged heating in air at temperatures of 1650°, 1800°, 2000°, and 2200° F. The effects of varying firing time, firing temperature, and number of coats applied were studied for one coating. NACA TN 2386.

TL 501 U69 2386

PACKING AND PACKAGING

ALUMINUM CONTAINERS FOR T-STOFF STORAGE AND PREPARATION. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1943-1944. 36f drawings (Text in German) Mi $2.25, Enl Pr $6.25. PB 103993

1. Containers, Aluminum - Germany 2. Hydrogen peroxide - Containers - Germany 3. Hydrogen peroxide - Storage - Germany 4. Micro BIOS FD 3116/46, Frames 1-25.

BATTERY PACKAGING MATERIAL. QUARTERLY REPORT NO. 1, OCT 15, 1948 TO JAN 15, 1949, CONTRACT NO. W36-039-SC-38174, by Mortimer H. Nickerson. DeBell & Richardson, Inc. Jan 1949. 19p fold drawing Mi $1.75, Ph $2.50. PB 103879

1. Batteries - Packaging materials 2. Cells, Dry - Packaging materials 3. SIG Contract W36-039-sc-38174 Quarterly report no. 1.

Dept. of the Army project: 3-93-00-500. Signal Corps project: 2005.

PACKAGING MATERIALS FOR DRY ELECTRIC BATTERIES, by Erik G. Linden and Sherwood Leeds. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Apr 1951. 42p diagrs, graphs, tables Mi $2.50, Ph $6.25. PB 103871

1. Batteries - Crating and packing 2. Cells, Dry - Crating and packing 3. Packaging materials - Lead foil 4. Lead foil - Uses 5. SCEL TM M1362.

Materials Section, Components and Materials Branch, Squier Signal Laboratory, Fort Monmouth, N. J. SIG C. Proj 2005-33. D.A. Proj no. 4-93-00-503.

PERFORMANCE TEST OF WIRE-BOUND WOOD BOXES FOR SHIPMENT OF GAS MASKS. INTERIM REPORT by Milton A. Raun. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Apr 1951. 14p photos, tables Mi $1.75, Ph $2.50. PB 103776

1. Boxes, Wooden - Tests 2. Respirators - Shipping containers 3. CC CRL IR 14.

Project 4-91-06-001.

PAPER AND ALLIED PRODUCTS

BEHAVIOUR OF PAPER UNDER STRESS AND STRAIN, by Borje Steenberg. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. 1949. 8p photos, diagrs, graphs Mi $1.25, Ph $1.25. PB 103452

By means of a series of new recording instruments the stress-strain behaviour of paper has been studied under widely different conditions. The rate of strain has been varied by a factor of more than 10^6. In the most rapid experiments the paper breaks within a milli-second. The slowest experiment requires several days. The behaviour of paper is rapid and slow straining processes is different and so are the changes brought about in the material by the straining processes. The ultimate tensile strength increases very markedly in the rapid experiments but the relative increase is also a function of the fibre composition of the paper. Extensibility is not very much affected by the rate of straining. From the stress-strain curves several properties of the paper may be evaluated. The plastic properties of the material is given by tracing apparent viscosity curves. The practical value of such information for judging the properties of, for instance flongs, is discussed. Special attention is given to stress-relaxation of paper under constant deformation. Paper presented at the annual meeting of the technical Section of the Canadian Pulp and Paper Association, Montreal, Que., January 26-28, 1949. Published in the Convention issue of Pulp and Paper Magazine of Canada v. 50, no. 3, p. 207. 1949. Svenska Träforskningsinstitutet. Träkemi och Pappersteknik. Meddelande 44.

PULP AND PAPER FROM KANSAS STRAW, by Clarence E. Grothaus. Kansas. University. Research Foundation. Oct 1949. 32p maps, graphs, tables Available from University of Kansas Research Foundation, Lawrence, Kansas. PB 104086

1. Paper - Manufacture 2. Pulp - Manufacture 3. Straw - Uses 4. Kansas. Industrial Development Commission.

Study sponsored by Kansas Industrial Development Commission.

PHOTOGRAPHIC AND OPTICAL GOODS

RADAR SCOPE PHOTOGRAPHY, by Myron G. H. Ligda. Massachusetts Institute of Technology. Dept. of Meteorology. Nov 1947. 74p photos, drawings, diagrs Mi $3.50, Ph $10.00. PB 104277

1. Radar - Scopes 2. Cameras, Aerial - Design 3. Photography, Radar scope 4. Radar, Meteorological 5. SIG Contract W36-039-sc-32038 Report no. 4.

Weather radar research. Technical report no. 4 under Contract W36-039-sc-32038.

SPECIAL RADAR SCOPE CAMERAS, by Myron G.H. Ligda. Massachusetts Institute of Technology. Dept. of Meteorology. Feb 1951. 43p photos, drawings Mi $2.50, Ph $6.25. PB 104284

These cameras were designed to satisfy certain research requirements, but one of them has also served to test the usefulness of rapid photographic developing and printing techniques in operational radar storm detection. Weather radar research. Technical report no. 11 under Contract W36-039-sc-32038. Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O. SIG Contract W36-039-sc-32038. Report no. 11.

STUDIES OF VISUAL TELESCOPE SYSTEM EMPLOYING REFLECTION OPTICS, by Theodore Dunham, Jr. Armed Forces National Research Council Vision Committee. Working group on Reflection Optics. Feb 1951. 79p photos, diagrs, graphs, tables Mi $3.50, Ph $10.00. PB 103858

1. Lenses, Meniscus 2. Lenses, Optical - Refraction 3. Telescopes, Gregorian - Corrections 4. Telescopes, Reflecting 5. KDC apparatus (For testing telescopes) 6. Interferometers, Optical 7. Optical research.

26 pages of illustrations in the appendices are not paged. Dr. Theodore Dunham, Jr., Chairman. Appendix I. Tests of a 20x50 meniscus-corrected

Gregorian telescope (Bouwers), by Howard S. Coleman. p. 15-16. - Appendix II. Certain aspects of the design and engineering of catadioptric meniscus systems, by David S. Grey. p. 17-21. - Appendix III. Reflecting systems of the Gregorian type corrected with a meniscus lens, by Robert E. Hopkins. p. 22-29. - Appendix IV. Influence of central stops on performance of a telescope, by Theodore Dunham, Jr. p. 30-34. - Appendix V. Influence of central stops upon visual resolution: Measurements of the influence of central stops on visual resolution, by R. Tousey, M. Koomen and R. Scholnik. p. 35-38. Measurements of the influence of central stops upon visual resolution, by H. Richard Blackwell, p. 38-45.

TRAINING BY TELEVISION, THE COMPARATIVE EFFECTIVENESS OF INSTRUCTION BY TELEVISION, TELEVISION RECORDINGS, AND CONVENTIONAL CLASSROOM PROCEDURES, by Robert T. Rock., Jr., James S. Duva, John E. Murray. Fordham University. Dept. of Psychology, New York, N. Y. n.d. 24p photos, diagrs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.75. PB 104414

1. Television 2. NAVEXOS P-850-2 3. SDC TR 476-02-2.

Contract N-7 onr 47602. Human engineering project 20-E-5a (Rapid mass learning).

TWO DIMENSIONAL MODEL ILLUSTRATING THE EFFECT OF THERMAL AGITATION DURING THE DEFORMATION OF METALLIC SOLIDS, by Roscoe H. Woolley and Dan McLachlan, Jr. Utah. Engineering Experiment Station, Salt Lake City, Utah. Mar 1949. 31p photos, diagrs Available from The Director, Utah Engineering Experiment Station, Salt Lake City, Utah. PB 103996

In the course of the study of the creep, flow, and failure of solids, particularly metals, it became desirable to have means of portraying the action of atoms dynamically. This was especially necessary in our present studies of the deformation of metals because we were making use of Eyring's reaction rate theory of Viscosity which takes account of the thermal agitation of the atoms and their activation energies. This theory requires much more than a knowledge of the static configuration of atoms in the metal lattice. Therefore a model was built to demonstrate the thermal action of metal atoms during shear, crystallization, melting and evaporation where metal spheres play the role of atoms. This paper describes the means of constructing an apparatus which facilitates making motion pictures of aggregates of these spheres under simulated thermal agitation. Bulletin no. 42. Bulletin of the University of Utah vol. 39, no. 18. UU EES B42.

PHYSICS

General

BOUNDARY LAYER IN COMPRESSIBLE FLUID, by J. A. Lewis. Brown University. Graduate Division of Applied Mathematics. Apr 1948. 72p graphs, tables Mi $3.50, Ph $10.00. PB 104376

1. Boundary layer - Bibliography 2. Boundary layer - Theory 3. Flow, Compressible - Velocity distribution 4. Flow, Compressible - Theory 5. GDAM A9-M-V 6. AAF TR 1179 ND.

Monograph V. Prepared under Contract W33-038-ac-15004 (16351).

ON THE COMPRESSIBLE POTENTIAL FLOW OVER A CLOSED BODY (PROJECT NO. HA-219) by K. Gottfried Guderley and Hideo Yoshihara. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Dec 1947. 34p Mi $2.25, Ph $5.00. PB 104238

A new method for computing the transonic flow over a closed body, by means of the hodograph, is given. The present method avoids difficulties inherent in methods proposed in the previous papers on the same subject. The body taken into consideration corresponds at zero free-stream Mach number to a circular cylinder. AAF TR 2176 ND.

Nuclear

CIRCULAR WAVE-GUIDE MAGIC-TEE, AND ITS APPLICATION TO A WAVE-GUIDE BRIDGE FOR THE COMBINATION OF UNEQUAL POWERS, AND A PHASE-SHIFTER UTILISING CIRCULAR POLARISATION, by B. E. Kingdon. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Oct 1950. 28f diagrs, graphs Mi $2.00, Enl Pr $5.00. PB 104358

1. Wave guides, Circular - Components - Gt. Brit. 2. Circuits, Phase-shifting - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. Micro AERE G/R 612 5. Micro BRR 3/51, Frames 1-27.

Abstract included. Abstract available as PB 104358s. 1p. Mi $1.25, Ph $1.25. HD 449.

DETECTION OF SLOW NEUTRONS. TWO LECTURES, by B. W. Sargent. National Research Council of Canada. Atomic Energy Project. Jun 1950. 45p diagrs, drawings, graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $.50. PB 104231

1. Neutrons, Delayed - Detection - Canada 2. Atomic power - Research - Canada 3. NRCC 2397 4. NRCC AEP LP-27.

Two lectures given at the Chalk River Laboratory, July 14, 1949, and July 18, 1949.

IRIDIUM 192 FOR GAMMA RAY RADIOGRAPHY, by Adair Morrison. National Research Council of Canada. Division of Physics. Industrial Radiology Laboratory. Feb 1951. 10p graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $.10. PB 103802

1. Iridium - Gamma ray spectrum 2. Gamma rays - Sources 3. Atomic power - Research - Canada 4. NRCC 2407 5. NRCC PR-91.

Divisional report no. PR-91

NUCLEAR TWO-BODY INTERACTIONS, by J. David Jackson. National Research Council of Canada. Atomic Energy Project. Jul 1950. 51p diagrs, graphs Available from National Research Council of Canada, Ottawa, Canada. $.50. PB 104229

The aim of these notes is to present a brief discussion of theory of the nuclear two-body problem and to summarize what we know at present about the forces between nucleous. These notes represent the text of a series of four lectures on the nuclear two-body problem. NRCC 2395. NRCC AEP LT-28.

SCATTERING OF NEUTRONS BY BOUND PROTONS AND CRYSTALS. LECTURES by H. H. Clayton. National Research Council of Canada. Atomic Energy Project. 1947. 71p diagr Available from National Research Council of Canada, Ottawa, Canada $1.00. PB 104227

1. Neutrons - Scattering - Canada 2. Protons - Reactions - Canada 3. Crystals - Reactions - Canada 4. Atomic power - Research - Canada 5. NRCC 2393. 6. NRCC AEP LT-21.

SCINTILLATION COUNTING. LECTURE GIVEN AT CHALK RIVER, by G. Cowper. National Research Council of Canada. Atomic Energy Project. Jun 1949. 21p diagrs Available from National Research Council of Canada, Ottawa, Canada. $.20. PB 104228

1. Detectors, Scintillation 2. Fluorescent materials, Radioactive - Measurements 3. Phosphorescent materials - Measurements 4. Atomic power - Research - Canada 5. NRCC 2394 6. NRCC AEP LE-22.

SOME NOTES ON THE NATURE OF EXPERIMENTS, ON THE STATISTICS OF COUNTING, AND ON THE FITTING OF EXPONENTIAL DECAY CURVES TO THE RESULT OF COUNTING EXPERIMENTS, by D. J. Behrens. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1951. 48f graphs, tables Mi $2.50, Enl Pr $7.50. PB 104361

1. Radioactivity - Measurements - Gt. Brit. 2. Radioactive substances - Decay - Gt. Brit. 3. Exponential functions - Tables - Gt. Brit. 4. Least squares - Gt. Brit. 5. Poisson's ratio - Gt. Brit. 6. Radiation counters - Mathematical analysis - Gt. Brit. 7. Micro AERE T/R629 8. Micro BRR 6/51, Frames 1-45.

Abstract included. Abstract available as PB 104361s. 2p. Mi $1.25, Ph $1.25.

STATISTICAL SIGNIFICANCE OF COUNTS DIFFERING ONLY SLIGHTLY FROM THE MEAN BACKGROUND LEVEL, by D. J. Behrens. Gt. Brit. Ministry of Supply. Atomic Energy Research Establishment. Jan 1951. 10f tables Mi $1.25, Enl Pr $2.50. PB 104360

1. Waste, Radioactive - Gt. Brit. 2. Radioactive substances - Measurement - Gt. Brit. 3. Atomic power - Research - Gt. Brit. 4. Micro AERE T/R640 5. Micro BRR 5/51, Frames 1-9.

Abstract included. Abstract available as PB 104360s. 1p. Mi $1.25, Ph $1.25. Revised version of T/R359.

THEORY OF BETA DECAY, by M. A. Preston. National Research Council of Canada. Atomic Energy Project. Sep 1950. 103p diagrs, graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $1.50. PB 104230

1. Beta rays - Energy - Canada 2. Atomic power - Research - Canada 3. NRCC 2396 4. NRCC AEP LT-29.

This account of beta decay is based on a series of seven lectures delivered by the author during 1950 at the Atomic Energy Project, Chalk River, Ontario.

RUBBER AND RUBBER PRODUCTS

ACROLEIN UND DERIVATE (ACROLEIN AND DERIVATIVES). ZIELSETZUNG FÜR ORGANISCH-SYNTHETISCHE ARBEITEN IN DER DEGUSSA (EXPERIMENTAL SUGGESTIONS FOR ORGANIC SYNTHESIS AT DEGUSSA). BUTADIEN AUS ALKOHOL, NACH PRÜFUNG DES RUSSISCHEN VERFAHRENS VON LEBEDEW (BUTADIENE FROM ETHYL ALCOHOL, TESTING LEBEDEW'S PROCESS), by Dr. Schulz. Deutsche Gold- und Silberscheideanstalt, Frankfort, Ger. Oct 1941-Apr 1942. 100f diagr, graphs, tables Mi $4.25, Enl Pr $13.75. PB 104177

1. Acrolein - Production - Germany 2. Acrolein - Derivatives - Germany 3. Chemical compounds, Organic - Synthesis - Germany 4. Butadiene - Production - Germany 5. Lebedew's process (Butadiene production) 6. Micro BIOS FD 1533/48, Frames 1-100.

Abstract available as PB 104177s. 2p. Mi $1.25, Ph $1.25.

BESCHREIBUNG DES VERFAHREN ZUR UNTERSUCHUNG DER DOUBLIERBARKEIT VON BUNA (DESCRIPTION OF METHOD FOR TESTING THE DOUBLING OF BUNA). I. G. Farbenindustrie A. G., Schkopau, Ger. 1940-1941. 8f diagrs, graphs (Text in German) Mi $1.25, Enl Pr $2.50. PB 104121

1. Rubber, Buna - Tests - Germany 2. Deka-Pneumatik G.m.b.H., Berlin 3. Continental Gummiwerke A. G., Hanover, Ger. 4. Micro BIOS FD 1159/49, Frames 1-7.

English abstract included. Abstract available as PB 104121s. 1p. Mi $1.25, Ph $1.25.

COMPARISON OF THE EFFECTIVENESS OF WINTERIZED AND MUD-SNOW TIRES ON SNOW AND ICE. National Safety Council. Committee on Winter Driving Hazards. 1950. 33p photos, graphs, tables Available from National Safety Council, 425 No. Michigan Ave., Chicago 11, Ill., in lots of 1-9, $.29 each; in lots of 10-99, $.23 each; in lots of 100-999, $.21 each; in lots of 1000 or more, $.20 each. PB 103790

1. Tires - Tests 2. Safety devices and measures.

HARTGUMMI FÜR CHLORANLAGEN (VULCANITE LININGS FOR CHLORINE PLANT), by Dr. Ebert. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Apr 1943. 6f table (Text in German) Mi $1.25, Enl Pr $2.50. PB 104176

1. Corrosion, Chlorine - Germany 2. Linings, Rubber - Germany 3. Rubber, Synthetic - Chlorine resistance - Germany 4. Micro BIOS FD 1482/48, Frames 1-6.

Abstract available as PB 104176s. 2p. Mi $1.25, Ph $1.25.

HYSTERESIS MEASUREMENTS OF RUBBER WITH THE AID OF DAMPING MACHINES. I. G. Farbenindustrie A. G., Schkopau, Ger. 1941-1944. 21f graphs (Text in German) Mi $2.00, Enl Pr $5.00. PB 104124

1. Rubber - Damping tests - Germany 2. Rubber, Synthetic - Hysteresis - Germany 3. Deka - Pneumatik G.m.b.H., Berlin 4. Micro BIOS FD 2359/47, Frames 1-20.

English abstract included. Abstract available as PB 104124s. 1p. Mi $1.25, Ph $1.25.

PLEXIGUM. TESTING EXPERIENCE WITH BUNA S AND SS, PERBUNAN AND IGELIT. I. G. Farbenindustrie A. G., Schkopau, Ger. Jul-Dec 1939. 15f (Text in German) Mi $1.75, Enl Pr $3.75. PB 104123

1. Plexigum (Trade name) 2. Perbunan (Trade name) 3. Igelit (Trade name) 4. Buna S (Trade name) 5. Buna SS (Trade name) 6. Rubber, Buna - Tests - Germany 7. Micro BIOS FD 2354/47, Frames 1-13.

English abstract included. Abstract available as PB 104123s. 2p. Mi $1.25, Ph $1.25. Minutes of July and Dec. meetings of Working committee for plastics to replace rubber, guttapercha and lead.

STANDARDIZATION OF PROPERTIES OF BUNA S, SS AND PERBUNAN. I. G. Farbenindustrie A. G., Schkopau, Ger. 1940-1944. 240f graphs, tables (Text in German) Mi $8.25, Enl Pr $31.25. PB 104122

1. Rubber, Buna - Tests - Germany 2. Rubber, Buna - Standardization - Germany 3. Buna S (Trade name) 4. Buna SS (Trade name) 5. Perbunan (Trade name) 6. Micro BIOS FD 1162/49, Frames 1-237.

English abstract included. Abstract available as PB 104122s. 1p. Mi $1.25, Ph $1.25.

TEST RETURNS AND GRAPHS RELATING TO BUNA MIXTURES USED IN THE MANUFACTURE OF TIRES. I. G. Farbenindustrie A. G., Schkopau, Ger. 1940-1944. 296f photos, graphs, tables (Text in German) Mi $9.00, Enl Pr $40.00. PB 104125

1. Rubber, Buna - Tests - Germany 2. Tires, Rubber - Synthetic - Tests - Germany 3. Micro BIOS FD 2414/47, Frames 1-289.

English abstract included. Abstract available as PB 104125s. 1p. Mi $1.25, Ph $1.25.

STRUCTURAL ENGINEERING

BUCKLING OF SANDWICH CYLINDERS. SYMMETRICAL BUCKLING OF SANDWICH CYLINDERS UNDER COMPRESSIVE END LOAD, by George Gerard. New York University. College of Engineering. Daniel Guggenheim School of Aeronautics. Jun 1949. 42f drawings, diagr, graphs, tables Mi $2.50, Enl Pr $7.50. PB 104215

The classical case of axial symmetric buckling is considered in the theoretical determination of buckling stresses of sandwich cylinders. Since the core of the sandwich possesses low shear rigidity, the effects of this factor were included in the theory. In addition to symmetrical buckling of the cylinder, consideration is given to the instability mode which involves wrinkling of the faces of the sandwich cylinder. The solution for the wrinkling stress depends upon an expression for the core foundation modulus. By fitting a polyminal of the fewest squares to the exact expression for the foundation modulus given by Hoff & Mautner for a flat sandwich panel, considerable simplification can be effected for the limiting case of a flat panel. Use of this polynomial also facilitates solution of the wrinkling of the faces of sandwich cylinder.

BUCKLING OF SANDWICH CYLINDERS. TESTS OF THIN SANDWICH CYLINDERS UNDER COMPRESSIVE END LOADS. PART I: C.C.A. CORE, by Frederick K. Teichmann and George Gerard. New York University. College of Engineering. Daniel Guggenheim School of Aeronautics. Jul 1949. 59f photos, graphs, tables Mi $2.75, Enl Pr $8.75. PB 104214

The introduction of sandwich construction in aircraft necessitated the theoretical and experimental study of the structural elements of aircraft, which included the study of circular cylinders. The investigation was divided into two phases: Phase 1, concerned with sandwich cylinders whose walls had a cellular cellulose acetate core in which the length and radius were varied; and Phase 2, concerned with the geometry of the sandwich walls itself. The tests of the sandwich cylinders with a CCA core indicated apparent correlation, with the theory of axisymmetric buckling of sandwich cylinders when due consideration is given to the variations in the core properties. Considerable additional test data is required, however, before the theory can be substantiated. Contract N6-onr-279, Task order V. See also PB 104215.

CHARTS GIVING CRITICAL COMPRESSIVE STRESS OF CONTINUOUS FLAT SHEET DIVIDED INTO PARALLELOGRAM-SHAPED PANELS, by Roger A. Anderson. U. S. National Advisory Committee for Aeronautics. Jul 1951. 31p diagrs, graphs, tables Mi $2.25, Ph $5.00. PB 104337

Charts giving the compressive-buckling-stress coefficients for continuous flat sheet divided by non-deflecting supports into parallelogram-shaped panels are presented. The results show that, over a wide range of panel aspect ratio, such panels are decidedly more stable than equivalent rectangular panels of the same area. NACA TN 2392.

CODE FOR DWELLING CONSTRUCTION FOR BUILDINGS HOUSING ONE OR TWO FAMILIES: MINIMUM STANDARDS TO REGULATE THE ERECTION AND PROVIDE FOR THE SAFETY OF BUILDINGS. National Research Council of Canada. Associate Committee on the National Building Code. 1950. 70p diagrs, tables Available from National Research Council of Canada, Ottawa, Canada. $.25. PB 103572

1. Houses - Construction - Canada 2. Buildings - Construction - Canada. 3. NRCC 2261.

Introduction in English and French. Abridged version of the National Building Code as published in 1941.

CREEP TESTS OF SANDWICH CONSTRUCTIONS SUBJECTED TO SHEAR AT NORMAL TEMPERATURES, by A. W. Voss and C. B. Norris. U. S. Forest Products Laboratory, Madison, Wis. May 1949. 40p photo, diagrs, graph, table Mi $2.25, Ph $5.00. PB 104448

Creep tests of sandwich constructions subjected to constant shear at normal temperatures were made, to determine the rate of relative motion between the faces of the constructions, and to determine the time elasped from application of the shear load to failure of the material. The constructions consisted of facings of glass-cloth laminate and a core of either cellular cellulose acetate, glass-fabric-base honeycomb, paper honeycomb, or cellular hard rubber. The relationship between the duration to failure and the magnitude of stress expressed as a percentage of the strength is given for the first three constructions No relationship could be established for the latter material. The cellulose acetate construction was capable of maintaining the highest percentage of strength. The paper honeybomb construction was the most rigid and capable of maintaining the highest unit stress for any test period. Study made in cooperation with the U. S. Air Force under Order no. '33-038)47-3979E. FPL 1806.

DESIGN AND CONSTRUCTION OF UNIVERSAL LOADING CURVES FOR ROLLED STEEL SECTIONS, by George T. Droste, Jr. Jan 1950. 34p graphs Mi $2.25, Ph $5.00. PB 104391

A simplified method for the solution of structural problems involving members which are subjected to combined axial and bending stresses is described. By use of the universal loading curves the most economical rolled section for any condition of leading may be found. Curves were plotted at 2-ft intervals and the sections included in the curves are listed, covering all wide flange, miscellaneous, and light-rolled column sections from the 14- to the 4-in. depth. The procedure for using the tables is to determine the maximum design moment and/or the maximum total direct design load to which the member is subjected. The table is then used to determine the maximum unsupported length of the member with respect to its least radius of gyration (the length about its minor axis). The major radius of gyration divided by minor radius of gyration and the allowable laterally unsupported length of members subjected to handling are tabulated. Thesis-Rensselaer Polytechnic Institute, 1950.

DESIGN CRITERIA (FLOORING), MODEL C-124A, by M. Stone and P. Altman. Douglas Aircraft Co., Long Beach, Calif. Sep 1949. 69f diagrs Mi $3.00, Enl Pr $10.00. PB 104219

Design criteria for the fuselage flooring of the Douglas C-124A four-engine cargo transport airplane are presented. A number of military vehicles, such as an air compressor truck, 8-in. gun carriage, T-37 tank, snow plow, and other vehicles of 50,000 lb or under, were considered in arriving at the design loads and distribution imposed on the compartment floor. Concentrated wheel loads, rolling loads, uniformly distributed loads, and tie-down loads were calculated for the track area, and for areas adjacent to the track. Report no. 10384. Contract no. W33-038-ac-20260.

EFFECT OF SUPERPOSITION OF STRESS-RAISERS ON MEMBERS SUBJECTED TO STATIC OR REPEATED LOADS, by A. Q. Mowbray, Jr. Illinois. Engineering Experiment Station, Urbana, Ill. Aug 1950. 41p photos, drawings, graphs, tables Mi $2.50, Ph $6.25. PB 104145

A study is presented of the decrease in the strength of members (stress-raising effect) produced by compound notches comprised of grooves superposed upon fillets. Full fillets were cut as transition sections at changes in width of a steel plate, and a small semicircular groove was superposed on each fillet. Static tensile loads were applied to the plate; measurements were made of the strains at the roots of the grooves, and the elastic stress concentration factors were calculated. In each case, the experimental stress concentration factor was found to be higher than the theoretical stress concentration factor for either the fillet alone or the groove alone. The ratio of the experimental stress concentration factor for the compound notch to the product of the theoretical factors for the groove and fillet alone ranged from 0.79 to 0.89. Compound notched rotating beam test results are also discussed. Portion of a research project entitled, "Behavior of materials under repeated stress", Project Director, T. J. Dolan. Sponsored by Office of Naval Research, U. S. Navy Contract N6-ori-71, T. O. IV: Project NR-031-005. ILU EES TR 18.

EXPERIMENTAL DETERMINATION OF THE CRITICAL BONDING MOMENT OF A BOX BEAM STIFFENED BY POSTS, by Paul F. Barrett and Paul Seide. U. S. National Advisory Committee for Aeronautics. Jul 1951. 9p photos, diagrs, graph Mi $1.25, Ph $1.25. PB 104538

An experimental determination of the critical bending moment of a box beam stiffened by posts is described and discussed. The experimental buckling load is in good agreement with that given by theory. Since appreciable distortion of the beam cross section occurred before the buckling load was reached, modification of post construction by the use of several ribs may be necessary for maintenance of the rectangular shape of the cross section. NACA TN 2414.

FLOOR FINISHES FOR INDUSTRIAL BUILDINGS, by G. E. Bessey. Gt. Brit. Dept. of Scientific and Industrial Research. Building Research Station, Watford, England. Aug 1950. 36p table (fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 104582

1. Floors - Durability - Gt. Brit. 2. Floors - Materials - Gt. Brit. 3. Floors, Cement - Gt. Brit. 4. Floors, Concrete - Gt. Brit. 5. Floors, Tile - Gt. Brit. 6. DSIR NB SR 11.

Title page is date 1951. S.O. Code no. 47-550-11.

RAPID SAMPLE PREPARATION METHOD FOR SOIL SELECTION IN EARTHWORK CONSTRUCTION, by Bob M. Galloway. Texas. Engineering Experiment Station, College Station, Texas. Jan 1951. 14p tables Available from Texas Engineering Experiment Station, College Station, Texas. PB 103680

1. Earthwork 2. Soils - Compaction 3. Atterberg Limits (Test for soil construction) 4. Highways - Construction 5. Roads - Surface treatment - Soil compaction 6. TU EES RR 20.

STATICS RATIO FOR ANALYSIS OF FRAMES THAT DEFLECT, by Phil M. Ferguson and Adris H. White. Texas. University. Bureau of Engineering Research. Nov 1950. 43p diagrs, tables Available from Bureau of Engineering Research, University of Texas, Austin, Texas. PB 104501

A general method for analyzing frames subject to several degrees of freedom of movement or deflection is proposed for practical use. The method operates upon an identical frame as a model. The model frame is arbitrarily deflected by trial increments until it is reasonably similar in its deflection pattern to that of the loaded frame. The arbitrary deflections are represented by simple moment distribution methods. Statics ratios, across particular sections of the frame, relate the resisting shears (or moments) on the deflected model to the external shears on the loaded frame. These ratios furnish the chief tool for the analysis. They determine the need for corrective deflections of the model and also the magnitude of these corrections; and finally they determine the degree of proportionality that results. True moments are determined by dividing the final model moments by the statics ratios. The method is shown to apply to trapezoidal panels as well as to rectangular. Special deflection patterns are developed to facilitate the solution of trapezoidal panels. University of Texas publication no. 5022. TU ERS 45.

SYMMETRICALLY LOADED RECTANGULAR PLATES FIXED AT POINTS, by C. J. Thorne. Utah. Engineering Experiment Station, Salt Lake City, Utah. Nov 1949. 71p graphs, tables Available from The Director, Utah Engineering Experiment Station, Salt Lake City, Utah. PB 103994

Deflection functions for thin plates with symmetric loads are given as a sum of biharmonic polynomials with coefficients determined by the slopes and deflections at equally spaced points on each edge of the plate. The coefficients are given numerically for a point load and a uniform load, for zero slope and deflection at the points for a square plate, a plate 2:1, a plate 3:1 and for a full fixed and not full fixed plate. Design data are calculated and plotted for the eleven examples. The design data are plotted along the center lines, the diagonals and the edges. Convergence is not a question since the exact conditions at the edges are plotted. Bulletin no. 39. Bulletin of the University of Utah vol. 39, no. 10. Presented before the American Mathematical Society, Nov 27, 1948, Los Angeles, Calif. UU EES B39.

TORSION AND TRANSVERSE BENDING OF CANTILEVER PLATES, by Eric Reissner and Manuel Stein. U. S. National Advisory Committee for Aeronautics. Jun 1951. 39p drawings, graphs, tables Mi $2.25, Ph $5.00. PB 104055

The problem of combined bending and torsion of cantilever plates of variable thickness, such as might be considered for solid thin high-speed airplane or missile wings, is considered. The deflections of the plate are assumed to vary linearly across the chord; minimization of the potential energy by means of the calculus of variations then leads to two ordinary linear differential equations for the bending deflections and the twist of the plate. Because the cantilever is analyzed as a plate rather than as a beam, the effect of constraint against axial warping in torsion is inherently included. The application of this method to specific problems involving static deflection, vibration, and buckling of cantilever plates is presented. In the static-deflection problems, taper and sweep are considered. NACA TN 2369.

TEXTILES AND TEXTILE PRODUCTS

EFFECT OF CONSTRUCTION ON THE LAUNDERING SHRINKAGE OF KNITTED WOOLENS, by Herman Bogaty, Arnold Sookne, Milton Harris and Louis I. Weiner. U. S. Office of the Quatermaster General. Military Planning Division. Research and Development Branch. Apr 1951. 18p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 104048

1. Wool - Shrinking 2. QMC TSR 66.

Prepared jointly by the staff of the Harris Research Laboratory, Washington, D. C. and the Textile Finishing Research Laboratory of the Research and Development Branch located at Philadelphia Quartermaster Depot. See also Textile Series Report no. 57 (PB 98574).

TEST OF SAMPLES OF HERRINGBONE TWILL CLOTH SPECIALLY IMPREGNATED BY GENERAL DYESTUFFS CORPORATION, by Robert R. Freeman and Charles J. Kaspar. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Interim report. May 1951. 11p graph, table Mi $1.75, Ph $2.50. PB 104078

1. Fabrics, Impregnated - Tests 2. General Dyestuffs Corporation 3. CC CRL IR 15.

Project 4-80-04-022.

TRANSPORTATION EQUIPMENT

Aeronautics
Aircraft

ANALYSIS OF STRAIN GAUGE MEASUREMENTS ON BARRACUDA REAR FUSELAGE - ARRESTED LANDING LOADING CONDITION, by D. C. Allen. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1945. 6p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 103928

Strain measurements made during a static strength test on a Barracuda V fuselage under arrested landing loading conditions have been compared with the stresses given by a theoretical analysis of the problem. End-loads calculated for a circular cylinder subjected to similar loading and shears determined by the same method but corrected for the effect of the tapering fuselage form the basis for the comparison. Direct stress at two sections of the fuselage and shear strains at one section have been examined. Cover date is 1951. S. O. Code no. 23-2390. ARC RM 2390.

BINARY AILERON-SPRING-TAB FLUTTER, by G. A. Naylor and Anne Pellew. Gt Brit. Ministry of Supply. Aeronautical Research Council. Apr 1942. 11p diagr, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 104330

This note deals with binary aileron-spring-tab flutter involving rotation of the aileron and spring tab about their hinge lines. The methods of R & M 1155 are used to calculate the variation of flutter speed with various parameters. Particular attention has been given to the magnitude and position of the tab mass-balance weight. It is concluded that binary aileron-spring-tab flutter can be prevented by mass-balancing the tab provided the balance weight is not placed further than a certain distance ahead of the tab hinge. This distance is in agreement with the limit suggested by Frazer and Jones. Although flutter can be prevented by adding mass at this limiting distance, the mass required is impracticably large; it becomes practicable if the arm is reduced to about three-quarters of the limiting distance. Cover date is 1951. S. O. Code no. 23-2576. ARC RM 2576.

CASE FOR FACTORS OF SAFETY OF 1.5 INSTEAD OF 2.0 WITH SPECIAL REFERENCE TO THE FLIGHT ENVELOPE, by P. E. Montagnon. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1944. 6p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 103975

1. Airplanes - Stress analysis - Gt. Brit. 2. Airplanes - Design - Safety factors - Gt. Brit. 3. Loads, Aerodynamic - Gt. Brit. 4. ARC RM 2578.

Cover date is 1951. S.O. Code no. 23-2578.

CHARTS AND TABLES FOR USE IN CALCULATIONS OF DOWNWASH OF WINGS OF ARBITRARY PLAN FORM, by Franklin W. Diederich. U. S. National Advisory Committee for Aeronautics. May 1951. 45p graphs, tables Mi $2.50, Ph $6.25. PB 103851

Charts and tables are presented of the downwash of a horseshoe vortex in incompressible flow. The use of the charts and tables in calculation of the downwash angles behind wings of arbitrary plan form is described and discussed. The results of a few calculations are compared with experimental results. NACA TN 2353.

COMPARATIVE WIND TUNNEL TESTS OF A SWEPTBACK AND A STRAIGHT WING HAVING EQUAL ASPECT RATIOS, by O. Holme. Flygtekniska Försöksanstalten (FFA) Stockholm. 1950. 26p photos, diagrs, graphs, table Mi $2.00, Ph $3.75. PB 104036

Wind tunnel tests, comprising three-component and pressure distribution measurements and flow investigations at the stall have been made with a sweptback and a straight wing having equal aspect ratios. In addition, investigations of the boundary layer thickness and the flow direction in the boundary layer have been made for the swept-back wing. In some cases the experimental results have been compared with results of theoretical calculations, and in general good agreement is found. FFA no. 31.

DESIGN OF A SUPERSONIC WIND TUNNEL USING A STEAM JET EXHAUSTER, by William Holland Shutts. May 1947. 102p photos, drawings, diagrs, graphs, tables Mi $4.50, Ph $13.75. PB 104233

1. Wind tunnels, Supersonic - Design 2. Wind tunnels, Supersonic - Equipment 3. Wind tunnels, Supersonic - Jet effect 4. Mach number - Effect.

Thesis-University of Colorado.

DESIGN OF FANS AND GUIDE VANES FOR HIGH-SPEED WIND TUNNELS, by W. A. Mair. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1944. 27p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 103930

For a wind tunnel in which the maximum speed at the working section exceeds about 300 ft per sec the fan will have a high solidity, and its design will usually be complicated by compressibility effects and blade interference. Thus the methods which have been used in designing fans for low-speed tunnels require some modification when the speed of the tunnel is increased. This report describes the method which has been used at the Royal Aircraft Establishment in designing fans and guide vanes for wind tunnels having maximum speeds above about 300 ft per sec. The effects of compressibility and blade interference are considered in detail and the method of design is fully explained. Cover date is 1951. S. O. Code 23-2435. ARC RM 2435.

EFFECT OF ASPECT RATIO AND SWEEPBACK ON THE LOW-SPEED LATERAL CONTROL CHARACTERISTICS OF UNTAPERED LOW-ASPECT-RATIO WINGS EQUIPPED WITH RETRACTABLE AILERONS, by Jack Fischel and John R. Hagerman. U. S. National Advisory Committee for Aeronautics. May 1951. 36p diagrs, graphs, table Mi $2.25, Ph $5.00. PB 103916

Results and discussion are presented of a low-speed lateral-control investigation of three untapered unswept wings of aspect ratio 1.13, 2.13, and 4.13 and an untapered 45° sweptback wing of aspect ratio 2.09 equipped with 0.60-semispan retractable ailerons having various projections. Continuous-span ailerons were tested at outboard stations on the unswept wings, and plain (continuous span) and stepped (segmented) ailerons were tested at various spanwise stations with and without stimulated actuating arms on the sweptback wing. NACA TN 2347.

EFFECT OF VERTICAL-TAIL AREA AND LENGTH ON THE YAWING STABILITY CHARACTERISTICS OF A MODEL HAVING A 45° SWEPTBACK WING, by William Letko. U. S. National Advisory Committee for Aeronautics. May 1951. 47p photo, drawings, graphs, tables Mi $2.50, Ph $6.25. PB 103903

Contains wind-tunnel results of an investigation made in the Langley stability tunnel to determine the effects of vertical-tail area and length on the low-speed yawing derivatives of a midwing airplane model having a 45° sweptback wing and tail surfaces. Comparisons of the measured contributions with those calculated by currently available procedures are also presented. The interference between the various model components is discussed. NACA TN 2358.

FLOATING CHARACTERISTICS OF A PLAIN AND A HORN-BALANCED RUDDER AT SPINNING ATTITUDES AS DETERMINED FROM ROTARY TESTS ON A MODEL OF A TYPICAL LOW-WING PERSONAL-OWNER AIRPLANE, by William Bihrle, Jr. U. S. National Advisory Committee for Aeronautics. May 1951. 67p photos, drawings, graphs, tables Mi $3.00, Ph $8.75. PB 103917

An investigation was conducted to determine the floating characteristics of full-length plain and horn-balanced rudders during rotary tests at spinning attitudes on a typical low-wing personal-owner airplane model. The investigation also included the determination of the effects of the horizontal tail and wing on the rudder floating characteristics. NACA TN 2359.

FLOW AROUND CONICAL TIPS IN THE UPPER TRANSSONIC RANGE, by Georg Drougge. Flygtekniska Försöksanstalten (FFA) Stockholm. 1948. 24p diagrs, graphs Mi $2.00, Ph $3.75. PB 104030

The purpose of this investigation is to determine, experimentally and theoretically, the pressure distribution and the corresponding drag coefficient for conical tips in supersonic flow. The investigation is restricted to the upper transsonic range, i.e. for those Mach Numbers greater than unity for which the shock wave is detached from the tip. Read at the 7th International Congress of Applied Mechanics, London. 1948. FFA no. 25.

GRAPHICAL TREATMENT OF BINARY MASS-BALANCING PROBLEMS, by R. A. Frazer. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1942. 10p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 103937

A graphical method, based on classical flutter theory, is described which provides a simple test of the effectiveness of mass-balancing in the prevention of flutter at various heights. Illustrative applications are made to flexural-aileron and servo-

rudder flutter. It is suggested that diagrams of this type may be a useful aid in design. Cover date is 1951. S. O. Code no. 23-2551. ARC RM 2551.

INVESTIGATION OF THE EFFECTS OF JET-OUTLET CUTOFF ANGLE OF THRUST DIRECTION AND BODY PITCHING MOMENT, by James R. Blackaby. U. S. National Advisory Committee for Aeronautics. Jun 1951. 28p photos, diagrs, graphs, table Mi $2.00, Ph $3.75. PB 104111

Wind-tunnel tests were made at low speeds to determine the effect on the pitching moment of a body of revolution of an unheated, subsonic air jet exhausting from the tail of a body through outlets cut off at various angles. Outlets cut off at angles of 0^{o}, 30^{o}, 60^{o}, and 75^{o}, measured from a plane normal to the axis of the body, were tested. In addition, visual studies were made in the region of the outlets with the jets exhausting into still air. The tests indicated that cutting off the outlet at the various angles had only a very small effect on the pitching moment of the body. NACA TN 2379.

INVESTIGATION OF THE NACA 4-(3) (08)-03 AND NACA 4-(3) (08)-45 TWO-BLADE PROPELLERS AT FORWARD MACH NUMBERS TO 0.725 TO DETERMINE THE EFFECTS OF COMPRESSIBILITY AND SOLIDITY ON PERFORMANCE, by John Stack, Eugene C. Draley, James B. Delano and Lewis Feldman. U. S. National Advisory Committee for Aeronautics. Jan 1944. 35p photos, drawing, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.30. PB 103906

1. Propellers - Wind tunnel tests 2. Propeller blades - Compressibility effects 3. Propeller blades - Solidity effects 4. Mach number - Effect 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va, 6. NACA 999.

Cover date is 1950.

ITERATIVE TRANSFORMATION PROCEDURE FOR NUMERICAL SOLUTION OF FLUTTER AND SIMILAR CHARACTERISTIC-VALUE PROBLEMS, by Myron L. Gossard. U. S. National Advisory Committee for Aeronautics. May 1951. 75p diagrs, graphs, tables Mi $3.50, Ph $10.00. PB 103979

The idea of the iterative transformation procedure suggested by H. Wielandt is explained. Application of the procedure to ordinary natural-vibration problems and to flutter problems is shown in numerical examples. Comparisons of computed results with experimental values and with results obtained by other methods of analysis are made. NACA TN 2346.

NUMERICAL SOLUTION OF THE PROBLEM OF THE LIFTING SURFACE WITH CONTINUOUS DISTRIBUTION OF VORTICITY, by O. Holme. Flygtekniska Försöksanstalten (FFA) Stockholm. 1950. 20p diagr, graphs, tables Mi $1.75, Ph $2.50. PB 104037

For the solution of the lifting surface problem an accurate numerical method is devised. The method is given only for rectangular wings in the present report, but an extension to swept-back and tapered wings is considered possible, although a number of new difficulties will arise and the computational work will be large. To facilitate the solution for rectangular wings of arbitrary aspect ratio certain functions have been computed and tabulated. The method has been applied to a square wing and the results have been compared with those of other methods. FFA no. 32.

ON MAXIMUM MODEL SIZE FOR WIND TUNNEL INVESTIGATIONS AT HIGH SUBSONIC MACH NUMBERS, by E. Petersohn. Flygtekniska Försöksanstalten (FFA) Stockholm. 1948. 12p drawings, graphs Mi $1.75, Ph $2.50. PB 104028

1. Wind tunnel tests - Sweden 2. Wind tunnels, Subsonic - Models - Sweden 3. Mach number - Effect - Sweden 4. Flow, Subsonic - Theory - Sweden 5. FFA no. 23.

STATUS OF PILOT'S PERSONAL LOADS QUICK DISCONNECT ASSEMBLY, PROJECT S-660-158, by Robert L. King. U. S. Air Development Force. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Apr 1951. 8p tables Mi $1.25, Ph $1.25. PB 104061

1. Pilots, Air - Equipment 2. Seats, Airplane - Ejector 3. Parachutes - Release devices 4. Aerotec Corporation, Greenwich, Conn. 5. D-100A (Pilot's personal leads quick disconnect assembly) 6. AAF TSEAA MR 660-120-J.

DCRD-660-120-J. For earlier report see PB 102996.

TEST OF TWO CUSTER CHANNEL WINGS HAVING A DIAMETER OF 37.2 INCHES AND LENGTHS OF 43 AND 17.5 INCHES (FIVE-FOOT WIND TUNNEL TEST NO. 545), by D. W. Young. U. S. Air Materiel Command. Engineering Division. Apr 1947. 71p photos, graphs, tables Mi $3.50, Ph $10.00. PB 104190

1. Wings - Wind tunnel tests 2. Wind tunnel tests 3. Wings, Channel - Tests 4. AAF TR 5568.

THREE-DIMENSIONAL UNSTEADY LIFT PROBLEMS IN HIGH-SPEED FLIGHT - THE TRIANGULAR WING, by Harvard Lomax, Max A. Heaslet and Franklyn B. Fuller. U. S. National Advisory Committee for Aeronautics. Jun 1951. 62p diagrs, graphs Mi $3.00, Ph $8.75. PB 104110

The indicial lift and pitching-moment coefficients are derived for flat-plate triangular wings at supersonic speeds. Coefficients are determined for angle-of-attack distributions corresponding to sinking and pitching wings. The wing with supersonic edges is completely analyzed, the wing with subsonic edges is partially analyzed; the solution in this case being completed for very narrow wings by an application of slender wing theory. In case of the supersonic edges, a comparison is made with known two-dimensional results and also with results for the same traingular wing in reversed flow. NACA TN 2387.

TWO-DIMENSIONAL TRANSONIC FLOW PAST AIRFOILS, by Yung-Huai Kuo. U. S. National Advisory Committee for Aeronautics. May 1951. 48p diagrs Mi $2.50, Ph $6.25. PB 103852

The problem of constructing solutions for transonic flow over symmetric airfoils is treated and simplification of the mapping of the incompressible flow is emphasized. In the case of a symmetric Joukowski airfoil without circulation the mapping is relatively simple, but the coefficients in the power series are difficult to evaluate. As a means of simplification an approximate flow is used which differs only slightly from the exact incompressible one when the thickness is small. Flow with circulation is also considered by the same method. NACA TN 2356.

WIND-TUNNEL EXPERIMENTS ON THE SQUIDDING OF PARACHUTES, by L.F.G. Simmons, R.W.F. Gould and C. F. Cowdrey. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1943. 19p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 103934

1. Wind tunnel tests - Gt. Brit. 2. Parachutes - Performance - Gt. Brit. 3. Gt. Brit. National Physical Laboratory. Aerodynamics Division 4. ARC RM 2523.

Cover date is 1951. S. O. Code no. 23-2523.

Instruments

AUTOMATIC CONTROL SYSTEMS SATISFYING CERTAIN GENERAL CRITERIONS ON TRANSIENT BEHAVIOR, by Aaron S. Boksenbom and Richard Hood. U. S. National Advisory Committee for Aeronautics. Jun 1951. 45p diagrs, graphs Mi $2.50, Ph $6.25. PB 104050

An analytical method is presented for the design of automatic controls that starts from certain arbitrary criterions on the behavior of the controlled system and gives those physically realizable equations that the control system can follow in order to realize this behavior. The criterions used are in the form of certain time integrals. General results are shown for systems of second order and of any number of degrees of freedom. Detailed examples for several cases in the control of a turbojet engine are presented. NACA TN 2378.

AVIATION CLOCK DIAL CHARACTERISTICS IN RELATION TO SPEED AND ACCURACY OF READING, by W. W. Plourd. Georgia Institute of Technology, Atlanta, Ga. Jun 1949. 60f photos, graphs Mi $2.75, Enl Pr $8.75. PB 104226

Four aviation clock dial designs were compared for speed and accuracy of reading in the 24 hour (military) time system in order to determine which design characteristics contributed to efficiency of reading. One was the conventional 12 hour design used on military aircraft. Another was a 24 hour design. The other two were original variations of a counter-pointer design wherein the hour appears on a counter on the face of the dial, and the minutes and seconds are indicated by hands. Tabulated results of visual tests with 85 subjects, 36 with pilot experience and 49 non-pilots, were used as the basis for evaluation of dial efficiency. It was concluded that the counter-point type of dial is significantly better than a multiple pointer dial for both speed and accuracy of reading.

BENCH-TEST INVESTIGATION OF THE TRANSIENT-RESPONSE CHARACTERISTICS OF SEVERAL SIMULATED AIRPLANES INCORPORATING AN AUTOPILOT SENSITIVE TO YAWING ACCELERATIONS, by Donald A. Howard. U. S. National Advisory Committee for Aeronautics. Jul 1951. 25p photos, diagrs, graphs, tables Mi $2.00, Ph $3.75. PB 104338

Bench-test results of the transient-response characteristics of four simulated airplane-autopilot combinations are presented for a system employing an autopilot sensitive to yawing accelerations. These results are compared with the transient-response characteristics calculated by combining the frequency response characteristics of the autopilot, measured separately, with the calculated frequency response characteristics of each of the four simulated airplanes. NACA TN 2395.

INSTRUMENTATION OF A B-17 AIRCRAFT FOR WEATHER RADAR FLIGHTS, by Harry C. Dresios. Massachusetts Institute of Technology. Dept. of Meteorology. Mar 1950. 91p photos, fold drawing, diagrs Mi $4.25, Ph $12.50. PB 104283

1. B-17 (Airplane) 2. Instruments, Meteorological 3. Radar, Airborne - Equipment 4. Radar, Meteorological 5. SIG Contract W36-039-sc-32038, Report no. 10.

Weather radar research. Technical report no. 10. under Contract W36-039-sc-32038. Dept. of the Army project: 3-99-05-022. Signal Corps project: 122 B-O.

LANDING DISPLAY FOR USE WITH A CONTACT FLIGHT SIMULATOR, by John M. Bell. Illinois. University. Dept. of Psychology. Mar 1951. 14p diagrs Mi $1.75, Ph $2.50. PB 104321

1. Pilots, Air - Training equipment 2. Flight training - Instruments 3. Simulators, Flight 4. SDC TR 71-16-8.

Project designation: NR784-003. Contract N6ori-71, T. O. XVI. SDC Human Engineering project: 20 L-1.

PRESENT STAGE OF DEVELOPMENT OF EXHAUST SILENCERS, by H. Martin, U. Schmidt and H. Willms. 1946. 21f diagrs, graphs Mi $2.00, Enl Pr $5.00. PB 104117

1. Silencers, Exhaust - Germany 2. Gt. Brit. Ministry of Aircraft Production 3. Micro RTP/T2596 4. Micro NAVSHIPS A1505-46.

Translated by Gt. Brit. Ministry of Aircraft Production from MTZ 1940 no. 12.

RECENT DEVELOPMENTS IN SILENCER TEST METHODS, by Herbert Martin. Jul 1941. 4f photos, graphs Mi $1.25, Enl Pr $1.50. PB 104118

1. Silencers - Tests - Germany 2. Gt. Brit. Ministry of Aircraft Production 3. Micro RTP/T 2598 4. Micro NAVSHIPS A1506-46.

Translated by Gt. Brit. Ministry of Aircraft Production from Rundschau deutscher technik v. 21, no. 29, 31 July 1941. Enclosure G to Letter report A 537-46 from NAA, London.

Engines and Propellers

FREE-SPACE OSCILLATING PRESSURES NEAR THE TIPS OF ROTATING PROPELLERS, by Harvey H. Hubbard and Arthur A. Regier. U. S. National Advisory Committee for Aeronautics. Feb 1949. 24p photos, graphs Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $.25. PB 103905

1. Propeller blades - Pressure distribution 2. Fuselages - Pressure distribution 3. Mach number - Effect 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA 996.

Cover date is 1950.

GENERAL PLASTIC BEHAVIOR AND APPROXIMATE SOLUTIONS OF ROTATING DISK IN STRAIN-HARDENING RANGE, by M. H. Lee Wu. U. S. National Advisory Committee for Aeronautics. May 1951. 57p graphs (1 fold), tables Mi $2.75, Ph $7.50. PB 103789

1. Materials, Aircraft - Plasticity 2. Materials, Aircraft - Stress analysis 3. Turbines - Stresses 5. Compressors - Stresses 5. U. S. Lewis Flight Propulsion Laboratory, Cleveland, Ohio 6. NACA TN 2367.

OB ODNOM GAZOVOM TECHENII S PRIAMOI LINIEI PEREKHODA (GAS FLOW WITH STRAIGHT TRANSITION LINE), by L. V. Ovsiannikov. May 1951. 13p diagr Mi $1.75, Ph $2.50. PB 103981

An investigation was conducted on the limiting case of a gas flow when the constant pressure in the surrounding medium is exactly equal to the critical pressure for the given initial state of the gas. Translated by S. Reiss from Prikladnaya matematika i mekhanika, vol. XIII 1949 p. 537-542. NACA TN 1295.

PROPELLER BLADE VIBRATION: NATURE AND SEVERITY OF VIBRATION AT EDGEWISE RESONANCE AS INFLUENCED BY COUPLING EFFECTS DUE TO BLADE TWIST, by J. F. Shannon and J. R. Forshaw. Gt. Brit. Ministry of Supply. Aeronautical Research Council. May 1951. 10p drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 104329

1. Propeller blades - Vibration - Gt. Brit. 2. Propeller blades - Twisting - Gt. Brit. 3. ARC RM 2561. Cover date is 1951. S. O. Code no. 23-2561.

TEMPERATURE DISTRIBUTION IN INTERNALLY HEATED WALLS OF HEAT EXCHANGERS WITH NONCIRCULAR FLOW PASSAGES USING COOLANTS WITH VERY LOW PRANDTL NUMBER, by E.R.G. Eckert and George M. Low. U. S. National Advisory Committee for Aeronautics. Jul 1951. 29p diagrs, graphs Mi $2.00, Ph $3.75. PB 104340

A method for the determination of the temperature distribution within the coolant and in the passage walls of a heat exchanger composed of polygonal flow passages is developed. The passage walls are heated uniformly by internal heat sources, and the coolant flowing turbulently through the passage is assumed to have a Prandtl number very much lower than 1. Applications of the method to heat exchangers with rectangular and triangular passages are presented. NACA TN 2401.

Aerodynamics

DIAGRAM FÖR TVADIMENSIONELL ÖVERLJUDSTRÖMNING MED EXEMPEL PA DESS ANVÄNDNING (DIAGRAM FOR TWO DIMENSIONAL SUPERSONIC FLOW, WITH APPLICATIONS), by G. Drougge. Flygtekniska Försöksanstalten (FFA) Stockholm. 1948. 14p diagrs (2 fold), graphs, table (Text in Swedish) Mi $1.75, Ph $2.50. PB 104029

1. Wings - Pressure distribution - Sweden 2. Flow, Supersonic - Sweden 3. Flow, Two dimensional - Sweden 4. FFA no. 24.

Summary in English.

EFFECT OF HORIZONTAL-TAIL LOCATION ON LOW-SPEED STATIC LONGITUDINAL STABILITY AND DAMPING IN PITCH OF A MODEL HAVING 45° SWEPTBACK WING AND TAIL SURFACES, by Jacob H. Lichtenstein. U. S. National Advisory Committee for Aeronautics. Jun 1951. 25p photo, drawings, graphs, tables Mi $2.00, Ph $3.75. PB 104311

Wind-tunnel results are presented to show the effect of changes in horizontal-tail location on the low-speed static longitudinal stability and steady-state rotary damping in pitch for a complete model with wing and tail surfaces having the quarter-chord lines swept back 45°. NACA TN 2381.

EXPERIMENTAL AERODYNAMIC TESTS AND STRUCTURAL ANALYSIS OF THE CHANNEL SHAPED WING, by James A. Sterhardt, Jr. Jan 1949. 83p photos, diagrs, graphs Mi $3.75, Ph $11.25. PB 103664

The effects were determined of different channel diameter-chord ratios on the lift and drag of the wing, the effect of outer panels on the channel, and the general aerodynamic characteristics of these combinations. These tests were conducted on two models, with and without a propeller revolving inside the channel. The channel had a definite inherent stability in pitch, which was emphasized by the addition of auxiliary wings outboard of the channel on either side. However, one wing mounted outboard of the channel had almost the effect on the lift and drag characteristics as two panels. The outer panels added a good percentage of lift to the channel through their very presence. In return, the channels added lift to that normally expected from the conventional wing. Thesis-Rensselaer Polytechnic Institute, Troy, N. Y.

EXPERIMENTAL INVESTIGATION INTO THE EFFECT OF THE GROUND ON THE MAXIMUM LIFT AND STATIC LONGITUDINAL STABILITY OF A LOW WING MONOPLANE EQUIPPED WITH FLAPS, by Roger D. Schaufele. Jan 1949. 55p photos, diagrs, graphs Mi $2.75, Ph $7.50. PB 103661

The effect of ground proximity on the maximum lift and static longitudinal stability of a low wing transport type airplane, equipped with split trailing edge flaps, was determined experimentally. The maximum lift of the airplane remained effectively constant for all height ratios. The static pitching stability of the model increased as the ground was approached. With negative elevator deflections, the lift coefficient for trim decreased as the ground was approached. The results of this test are deemed accurate to within 4%, and are presented in the form of curves of the aerodynamic coefficients showing the effect of the ground at each of five ground positions. Thesis-Rensselaer Polytechnic Institute, Troy, N. Y.

LINEAR THEORY OF BOUNDARY EFFECTS IN OPEN WIND TUNNELS WITH FINITE JET LENGTHS, by S. Katzoff, Clifford S. Gardner, Leo Diesendruck and Bertram J. Eisenstadt. U. S. National Advisory Committee for Aeronautics. Dec 1948. 40p Available from Government Printing Office, Superintendent of Documents, Washington 25, D. C. $.30. PB 104113

1. Boundary layer - Theory 2. Wind tunnel tests 3. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 4. NACA 976 5. NACA TN 1826. Cover date is 1950.

LOW-SPEED WIND TUNNEL INVESTIGATION OF THE CHANGE IN AERODYNAMIC CENTRE POSITION AND IN CMO DUE TO PROPELLER TURBINE NACELLES, by D. A. Kirby and F. W. Dee. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1950. 38p drawings, graphs, tables Available

from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 104082

Low speed wind tunnel tests have been made on the effect of propeller turbine type nacelles on the position of the aerodynamic centre and the pitching moment at zero lift of a multi-engined aircraft. This investigation forms part of a series of tests made to improve stability prediction data, primarily for civil aircraft. A plain rectangular wing was used to test various lengths of nacelle overhang and rear fairing for both chordline and underslung nacelles parallel and drooped at -4° to the wing chordline. Tests were also made with (i) two nacelles on a wing to find the mutual interference between them, (ii) nacelles on both low and high wings on a fuselage to find the interference between the body and a nacelle. The results have been presented in a form suitable for predicting the total effect on longitudinal stability of the nacelles of a turbine driven multi-engined aircraft. Cover date is 1951. Report no. Aero. 2356. ARC CP no. 39. ARC TR 13185.

METHOD OF CALCULATION OF DOWNWASH BEHIND A SWEPT WING, by Austin H. Gale. Jan 1949. 68p diagrs, graphs, tables Mi $3.00, Ph $8.75. PB 103662

A method has been developed by which the downwash may be evaluated in the plane of the wing. The method consists of first finding the circulation distribution by the Weissinger lifting line method and then using a modified form of the same theory to determine the downwash at desired points. In a comparison with experimental data on a rectangular wing of aspect ratio 1.5 and sweep of 60°, it was found that the experimental data confirmed the trends predicted by the calculations. Results show that both experimentally and theoretically there is a decrease in downwash with an increase in sweep. This decrease in downwash is caused by the movement of aerodynamic loading toward the tips with increase in sweep. Thesis-Rensselaer Polytechnic Institute, Troy, N. Y.

SPANWISE LIFT DISTRIBUTION OF SWEPTBACK WINGS BY THE WEISSINGER METHOD, by Raymond Vachs. Republic Aviation Corp., Farmingdale, N. Y. Jul 1949. 37f tables Mi $2.25, Enl Pr $6.25. PB 104217

Tables are presented for numerical solution of the spanwise lift problem by means of the Weissinger method. This method permits the expression of lift distribution for swept wings with straight leading and trailing edges. A set of simultaneous equations, taking into account planform, location of computation points, and the form of the integral location, is developed. A set of notes on matrix operations is included. The method of matrix inversion employed is believed to be fairly fast, and subject to running checks. Report no. EAR-195.

SUMMARY OF DYNAMIC STABILITY AND CONTROL FLIGHT RESEARCH CONDUCTED UTILIZING A B-25J AIRPLANE, by W. O. Breuhaus. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. May 1948. 65p photo, drawing, diagrs, graphs, tables Mi $3.00, Ph $8.75. PB 104239

A comprehensive program of research has recently been completed by the Flight Research Department of the Cornell Aeronautical Laboratory to determine the dynamic stability and control characteristics of aircraft in flight. This program, which was conducted under the auspices of the Aerodynamics Branch, Aircraft Laboratory of the USAF at Wright Field, was carried out utilizing a B-25J as a test airplane. The work included both theoretical and experimental investigations of the longitudinal and lateral modes of motion of an aircraft. Attention was focused primarily on the analysis of the steady state oscillatory motion corresponding to a steady sinusoidal motion of a control surface, although a limited amount of work was devoted to the analysis of the transient motion of an airplane following an abrupt (step) deflection of a control surface from the position required for trim to a new constant position. Throughout these tests the airplane was controlled by an automatic pilot. Detailed reports of each phase of the entire program were prepared at the completion of these phases. It is the purpose of this report to summarize briefly the results of all the tests, and to reference those reports which contain more detailed information concerning specific items. It has been concluded from the results of this program and from similar additional tests which have also been conducted at this Laboratory that the dynamic characteristics of aircraft can be measured in flight, and that these data may be analyzed in terms of the fundamental stability derivatives which basically determine the flying qualities of aircraft. Contract W33-038-sc-14248. AAF TR 5785.

THERMAL STRESSES IN A WING FLYING AT SUPERSONIC SPEEDS, BY GEORGE H. EISENHARDT AND WARREN M. ROHSENOW. REPORT B UNDER CONTRACT W-33-038-AC-17239, D.I.C. PROJECT NO. 6580. Massachusetts Institute of Technology. Division of Industrial Cooperation. Jun 1949. 31p diagrs, graphs Mi $2.25, Ph $5.00. PB 104045

A method for calculating thermal stresses is presented and applied to a solid symmetrical double-wedge steel wing flying at an altitude of 50,000 feet. After flying steadily at a Mach of 1.4 and having a uniform temperature distribution of 531.6°F abs, the wing is accelerated at a constant rate of 1 Mach per 30 seconds until a Mach of 6.0 is reached. Thermal stresses at the instant the wing reaches a Mach of 6.0 are calculated using the elastic properties of steel at room temperature. A method for calculating the thermal stresses is presented and applied to the solution of a specific example.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

BIBLIOGRAPHY AND ABSTRACTS OF ARTICLES RELATING TO SLAUGHTERHOUSE AND PACKINGHOUSE WASTES, by Donald D. Gold. Tennessee. Engineering Experiment Station, Knoxville, Tenn. May 1951. 50p Available from Engineering Experiment Station, University of Tennessee, Knoxville, Tenn. PB 104318

1. Sewage disposal - Bibliography 2. Packinghouses - Waste - Bibliography 3. Slaughterhouses - Waste - Bibliography 4. Greases - Recovery from waste - Bibliography 5. TEES B no. 14.

FIXTURE UNIT RATINGS AS USED IN PLUMBING SYSTEM DESIGN, by Herbert N. Eaton and John L. French. U. S. Housing and Home Finance Agency. Division of Housing Research. March 1951. 18p graphs Available from Superintendent of Documents,

Government Printing Office, Washington 25, D. C. $.15. PB 103696

1. Plumbing systems - Loads 2. HHFA RP 15.

PURIFICATION OF THE WATER OF SWIMMING BATHS, by R. G. Hetherington, N. R. Beattie, A. Key, G. M. McNaughton and E. L. Sturdee. Gt. Brit. Ministry of Health. 1951. 35p drawing Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 103926

1. Swimming pools - Sanitation - Gt. Brit. 2. Water - Purification - Gt. Brit.

S. O. 32-287-0-50.

WATER IN INDUSTRY: SURVEY OF WATER USE IN INDUSTRY, by George G. Hagedorn, Robert G. Snider, Roy R. Green, and Stephen W. Bergen. National Association of Manufacturers New York, N. Y. and Conservation Foundation, New York, N. Y. Dec 1950. 50p diagrs, tables Mi $2.50, Ph $6.25. PB 103869

1. Water - Uses.

WATER MEASUREMENT, by Wayne D. Criddle and Eldon M. Stock. Utah. Engineering Experiment Station, Salt Lake City, Utah. Jun 1941. 50p photos, drawings, graphs, tables Available from The Director, Utah Engineering Experiment Station, Salt Lake City, Utah. PB 103972

1. Water - Measurement 2. Irrigation.

Bulletin no. 2.

MISCELLANEOUS

ACCIDENTS: HOW THEY HAPPEN AND HOW TO PREVENT THEM. DESCRIPTIONS OF CERTAIN ACCIDENTS NOTIFIED TO H. M. INSPECTORS OF FACTORIES. Gt. Brit. Ministry of Labour and National Service. Factory Department. Apr 1951. 28p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.25. PB 103971

1. Accidents, Industrial - Prevention - Gt. Brit.

Volume 7 (New series), April 1951 (Published quarterly). S. O. Code no. 72-21-7.

CATALOG OF OSRD REPORTS. U. S. Library of Congress. Navy Research Section. Jan 1950. 8p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D.C. Mimeo: $.25. PB 104375

1. Research - Bibliography 2. Scientific research - Bibliography 3. U. S. Office of Scientific Research and Development 4. U. S. National Defense Research Committee.

CATALOG OF OSRD REPORTS: DIVISION 1. BALLISTIC RESEARCH, COMPILED AND EDITED by Sylvia E. Weiss and Lillian A. Hamrick. U. S. Library of Congress. Navy Research Section. Jan 1950. 8p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.25. PB 104375s

1. Ballistics - Bibliography 2. Ballistics - Research.

Supplement 1 to PB 104375.

CATALOG OF OSRD REPORTS: DIVISION 2. EFFECT OF IMPACT AND EXPLOSION, COMPILED AND EDITED by Sylvia E. Weiss and Lillian A. Hamrich. U. S. Library of Congress. Navy Research Section. Jan 1950. 15p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 104375s2

1. Explosions - Effects - Bibliography 2. Impact - Effects - Bibliography.

Supplement 2 to PB 104375.

CATALOG OF OSRD REPORTS: DIVISION 3. ROCKET ORDNANCE, COMPILED AND EDITED by Sylvia E. Weiss and Elizabeth C. McCue. U. S. Library of Congress. Navay Research Section. Aug 1950. 17p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 104375s3

1. Rockets - Development - Bibliography 2. Ordnance equipment - Bibliography.

Supplement 3 to PB 104375.

CATALOG OF OSRD REPORTS: DIVISION 4. ORDNANCE ACCESSORIES, COMPILED AND EDITED by Sylvia E. Weiss and Elizabeth C. McCue. U. S. Library of Congress. Naval Research Section. Nov 1950. 10p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.25. PB 104375s4

1. Ordnance equipment - Bibliography.

Supplement 4 to PB 104375.

CATALOG OF OSRD REPORTS: DIVISION 5. NEW MISSILES (UNCLASSIFIED REPORTS), COMPILED AND EDITED by Sylvia E. Weiss and Elizabeth C. McCue. U. S. Library of Congress. Navy Research Section. Jan 1951. 11p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.50. PB 104375s5

1. Missiles - Bibliography.

Supplement 5 to PB 104375.

CATALOG OF OSRD REPORTS: CUMULATIVE INDEXES TO DIVISIONS 1-5. U. S. Library of Congress. Navy Research Section. n.d. 9p tables Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. Mimeo: $.25. PB 104375s6

Supplement 6 to PB 104375. Contents: Cumulative contractor index. p. i-ii. - Cumulative contract number index. p. ii-iii. - Cumulative OSRD number index. p. iv-v. - Cumulative report number index. p. vi-vii. - Cumulative author index. p. viii-ix.

CROP INSURANCE IN JAPAN, by William H. Rowe. Supreme Commander for the Allied Powers. Natural Resources Section. Jul 1951. 49p graphs, tables Mi $2.50, Ph $6.25. PB 104632

1. Crops - Insurance - Japan 2. Insurance, Agricultural - Japan 3. SCAP NRS PS 58.

EVALUATION OF HEARING AIDS (RELEVANT TO SERVICE CONTROL NO. AN-10): SECTION II: PERFORMANCE TESTS OF HEARING AIDS, SUBMITTED by C. V. Hudgins, G. E. Peterson, J. E. Hawkins and Douglas A. Ross. Harvard University. Psycho-

Acoustic Laboratory and Harvard University. Electro-Acoustic Laboratory. Apr-Dec 1945. 463p photos, diagrs, drawings, graphs Mi $9.00, Ph $58.75. PB 103354

This report presents the results of an experimental evaluation of certain aspects of the performance of hearing aids, as determined by physical and psychophysical methods. Includes: PNR-7. Selection of hearing aids, submitted by Hallowell Davis and Douglas A. Ross Dec 1945. Approved by S. S. Stevens, Director. Office of Scientific Research and Development, National Defense Research Committee, Division 17, Section 17.3. Contract OEMsr-658. OSRD Report no. 4666. MHR-88. This work has been completed under Contract N5ori-76, Project order II. OSRD 4666. PNR 7.

EVALUATION OF THE K-S DISPOSAL OXYGEN MASK, BY ULRICH C. LUFT, WITH THE TECHNICAL ASSISTANCE OF Samuel G. Karst and Loy D. Wilson. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jan 1951. 12p photo, graphs, tables Mi $1.75, Ph $2.50. PB 103231

1. K-S (Disposable oxygen mask) 2. Respirators, Oxygen generating - Disposable 3. AAF SAM Proj Special project.

Special report.

EXPANSION OF DAIRY GOAT HUSBANDRY IN JAPAN, by Corl A. Leach. Supreme Commander for the Allied Powers. Natural Resources Section. Jun 1951. 57p tables Mi $2.75, Ph $7.50. PB 104423

1. Dairies and dairying - Japan 2. Goats - Japan 3. SCAP NRS PS55.

FOREST POLICY AND LEGISLATION FOR JAPAN, by Tom Gill. Supreme Commander for the Allied Powers. Natural Resources Section. May 1951. 29p Mi $2.00, Ph $3.75. PB 104001

1. Forests and forestry - Japan 2. SCAP NRS PS49.

GEBRAUCHSANWEISUNG DRÄGER TAUCHRETTER (INSTRUCTIONS FOR USE OF DRÄGER DIVING EQUIPMENT). Drägerwerk Heinrich & Bernhardt, Lübeck, Ger. May-Jun 1942. 34f photos, diagrs (Text in German) Mi $2.25, Enl Pr $6.25. PB 103840

1. Diving equipment - Germany 2. Micro NAVSHIPS S89-46.

INSPECTION GOGGLE FOR CHECKING VISIBLE SPECTRAL QUALITY OF LIGHTING FOR DARK ADAPTATION, by Dean Farnsworth. U. S. Navy. Medical Research Laboratory, Naval Submarine Base, New London, Conn. Mar 1951. 23p photo, graphs, tables Mi $2.00, Ph $3.75. PB 104625

An inspection goggle is described with which a visual check can be made by an eye of normal color vision of the spectral composition of red light to determine its conformance to Naval specifications for dark adaptation. Observed results on sample glasses are compared with calculated results. Bu Med Project NM003 041.40 Report no. 1. MRL Report no. 170, vol. 10, 1951, p. 1-17. NAV MRL 170.

JAPANESE AGRICULTURAL CREDIT AND FINANCING, by R. J. Barry. Supreme Commander for the Allied Powers. Natural Resources Section. Jun 1951, 30p diagrs, tables Mi $2.00, Ph $3.75. PB 104421

1. Agricultural credit - Japan 2. Agricultural finance - Japan 3. SCAP NRS PS53.

JAPANESE ANTARCTIC WHALING EXPEDITION, 1949-50. STATISTICAL SUMMARY, by William M. Terry and Lt. Comdr. Francois Bourgois. Supreme Commander for the Allied Powers. Natural Resources Section. Oct 1950. 50p graphs, tables Mi $2.50, Ph $6.25. PB 103339

1. Whaling - Japan 2. SCAP NRS PS41.

JAPANESE CROP AND LIVESTOCK STATISTICS, 1878-1950, by Joseph C. Dodson and Clark C. Milligan. Supreme Commander for the Allied Powers Natural Resources Section. Jun 1951. 135p maps, graphs, tables Mi $5.50, Ph $17.50. PB 104629

1. Crops - Statistics - Japan 2. Livestock - Production - Japan 3. SCAP NRS 143.

JAPANESE FRESH-WATER FISHERIES AND WATER USE PROJECTS, by Richard VanCleve. Supreme Commander for the Allied Powers. Natural Resources Section. Jul 1951. 31p maps, table Mi $2.25, Ph $5.00. PB 104633

1. Fisheries - Japan 2. Water - Pollution - Japan 3. SCAP NRS PR 59.

KONZERN-UND KARTELLBILDUNG IN DER DEUTSCHEN KOHL-UND EISENINDUSTRIE (COMBINES AND CARTELS IN THE GERMAN COAL AND IRON INDUSTRY), by Alf Noll. Studiengesellschaft für Bäuerliche Rechts-und Wirtschaftsordnung. Sep 1940. 234f (Text in German) Mi $8.25, Enl Pr $31.25. PB 103820

1. Cartels - Germany 2. Coal trade - Corporations - Germany 3. Iron and steel industry - Corporations - Germany 4. Micro BIOS FD 1752/46, Frames 1-232.

English abstract included. Abstract available as PB 103820s. 2p. Mi $1.25, Ph $1.25.

MANAGEMENT AND ADMINISTRATION OF RANGE LANDS IN JAPAN, by Walt L. Dutton. Supreme Commander for the Allied Powers. Natural Resources Section. n.d. 35p tables Mi $2.25, Ph $5.00. PB 104634

1. Range lands - Japan 2. SCAP NRS PS 60.

ORGANIZATION PLAN FOR FARM HOME LIFE RESEARCH IN JAPAN, by Maud Wilson. Supreme Commander for the Allied Powers. Natural Resources Section. Jun 1951. 56p diagrs, table Mi $2.75, Ph $7.50. PB 104422

1. Economic research - Japan 2. Home economics - Japan 3. SCAP NRS PS 54.

RAFT, PNEUMATIC, TYPE E-2B - QUALIFICATION TEST SAMPLE, by Wayne B. Yarcho. U. S. Air Materiel Command. Engineering Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1951. 3p. Mi $1.25, Ph $1.25. PB 103237

1. Rafts, Life - Pneumatic - Tests 2. E-2B (Life raft) 3. American Pad and Textile Company, Greenfield, Ohio 4. AAF SP-R-5773 5. AAF TSEAA MR 670-1AA.

Memorandum report MCREXD-670-1AA,